ORDER NO. MAC0112090C0

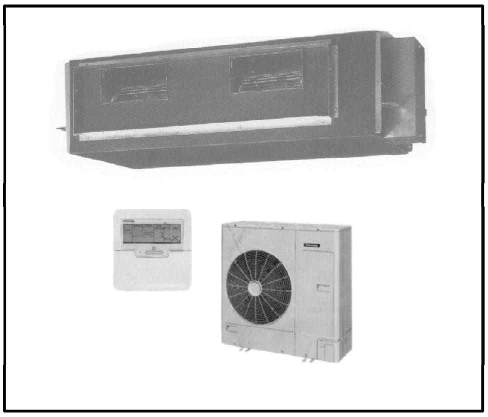
Service Manual

AIR CONDITIONER

HIDE AWAY TYPE

HEAT PUMP MODEL

CS-A24BD1P (CU-A24BBP5)
CS-A28BD1P (CU-A28BBP5, CU-A28BBP8)
CS-A34BD1P (CU-A34BBP5, CU-A34BBP8)
CS-A43BD1P (CU-A43BBP8)
CS-A50BD1P (CU-A50BBP8)



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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

⚠ PRECAUTION OF LOW TEMPERATURE

In order to avoid frostbite, be assured of no refrigerant leakage during the installation or repairing of refrigeration circuit.

1. SERVICE INFORMATION

Notice of Address setting for NEW Cassette / NEW Outdoor Unit.

The new Ceiling / New Outdoor models are possible to have address setting for twin / triple control or group control by automatic when main power supply is switched on.
(Manual address setting is also possible by using Dip switch on Indoor unit P.C. board.)
However, this address setting is only possible when made proper wiring connection and also Indoor unit should be original virgin unit.

1.1. Example of trouble at test operation

If found out as following phenomenon at test operation on site, it may have possibility of wrong address setting. / Therefore, please ensure of the address setting.

1. **LCD display of wired remote control had not illuminate although the main power supply switch is 'on'.**
2. **LCD display had indicated as normal illumination when power supply switch is 'on', however outdoor unit cannot be operated. / (But, it is necessary to take 3 to 5 minutes for outdoor unit to start from the timing of remote control ON/OFF switch is 'on'.)**
3. **P.C. board had memorized wrong setting information.**
   - **A. If main power supply is switched 'on' with the wrong connection.**
   - **B. When changing the connection or combination of units due to re-installation etc.**
     - **When changing the system from twin to triple (triple to twin).**
     - **When changing the system from group control to normal one to one system.**
     - **When making the replacement of units as master and slave etc.**

1.2. Caution of test operation

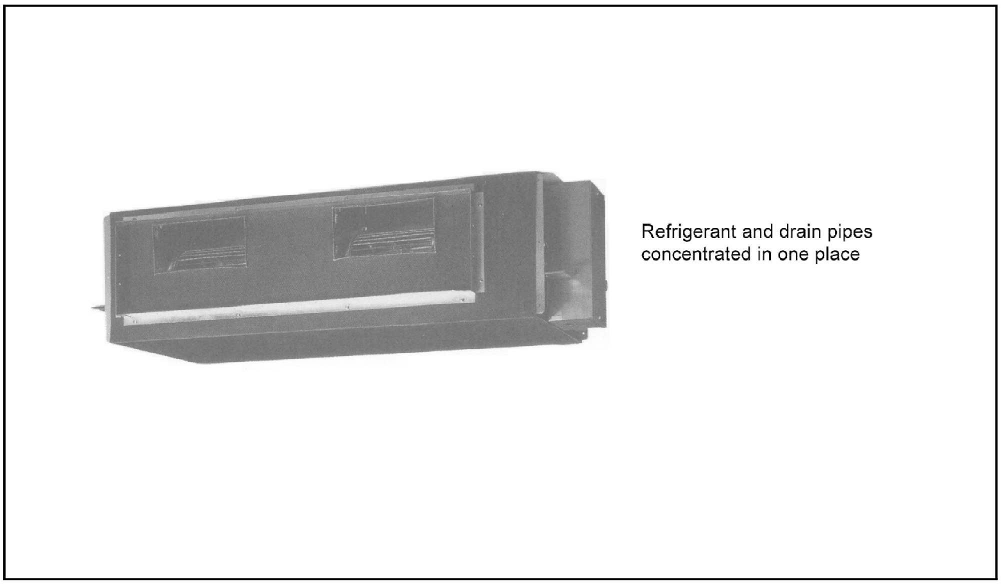
Do not touch the remote control switch and do not change any wirings for one minute when the main power supply switch is 'on'. / (Because the unit is having automatic address setting during the first one minute.)

1.3. Caution during automatic address setting

When main power supply switch is 'on', the P.C. board will automatically memorized the connecting system. / Consequently, when initial power supply is 'on', there will not be interchangeability of units even of the same type and same capacity unit. Therefore unable to connect the unit to another system.

2. FEATURES

2.1. Variety of excellent features /



2.1.1. Compact design

- The height is only 29cm (2.5 HP model and 3 HP model) and can be installed even where the space is limited.

2.1.2. Automatic restart function

- When the electric power comes back after a power failure, the unit itself automatically restarts the operation in the pre-failure mode.

2.1.3. Auto fan mode (indoor unit)

- Auto fan mode is added besides Hi, Me and Lo. / It automatically adjusts the fan speed according to the indoor temperature.

2.1.4. Dry mode function

- Dry mode can make a comfortable indoor environment during wet season.

2.1.5. Quiet operation

- The sound level is as low as 42db (A) for 3 HP model and suitable for offices, shops, homes etc, where quiet operation is essential.

2.1.6. Low ambient cooling operation

- Cooling is possible to temperature as low as-5°C

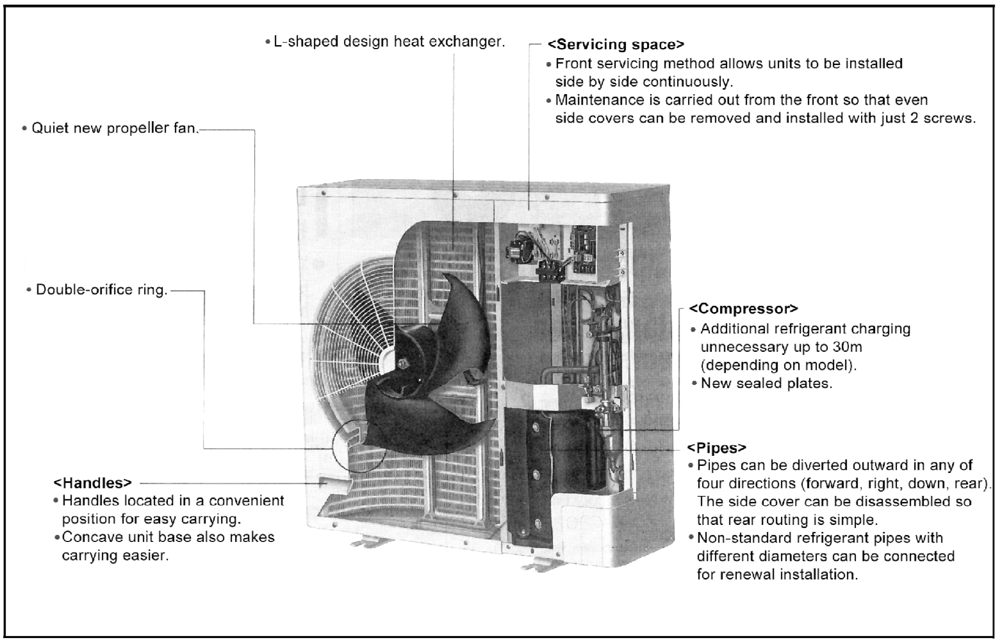
2.1.7. Automatic changeover function (heat pump models)

- The unit automatically switches between cooling and heating in accordance with operating load in order to maintain a comfortable

indoor temperature.

2.1.8. Hot start system / (heat pump model)

2.2. New low-noise outdoor units



- L-shaped design heat exchanger.

<Servicing space>
- Front servicing method allows units to be installed side by side continuously.
- Maintenance is carried out from the front so that even side covers can be removed and installed with just 2 screws.

- Quiet new propeller fan.

- Double-orifice ring.

<Compressor>
- Additional refrigerant charging unnecessary up to 30m (depending on model).
- New sealed plates.

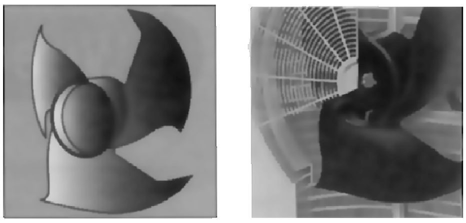
<Pipes>
- Pipes can be diverted outward in any of four directions (forward, right, down, rear). The side cover can be disassembled so that rear routing is simple.
- Non-standard refrigerant pipes with different diameters can be connected for renewal installation.

<Handles>
- Handles located in a convenient position for easy carrying.
- Concave unit base also makes carrying easier.

[Product features]

2.2.1. Low-noise design improves in surrounding areas

1. **The noise-suppressing winglet fan is a result of new research into vane design theory. The unique curved shape suppresses the generation of vortexes, thus reduces air flow noise.**



2. **The adoption of double-orifice rings reduces air passage resistance.**
3. **Strengthening of the noise insulation materials in the compressor and the sealing-in of mechanical noise allows vibration noise to be greatly enclosed and suppressed.**

4. The heat exchanger has an L-shaped design to allow air to flow more smoothly.
5. Noise is automatically reduced further during night time operation with lower outdoor air temperatures.

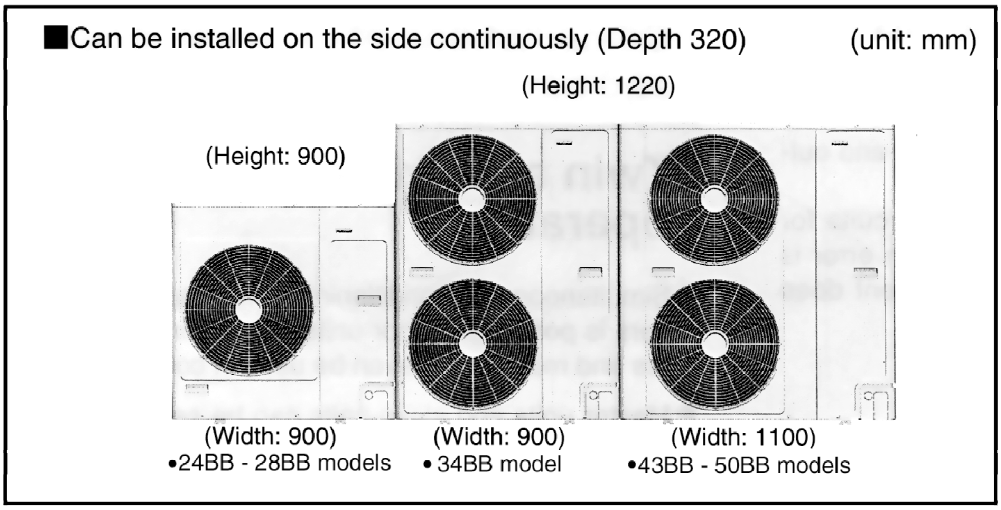
2.2.2. Automatic restart function

When the electric power resumes after a power failure, the unit will automatically restarts the operation in the pre-failure mode.

2.2.3. Low ambient cooling operation

Cooling operation is possible at outdoor temperature of -5~C.

2.3. Greatly improved workability increases system renewal capability

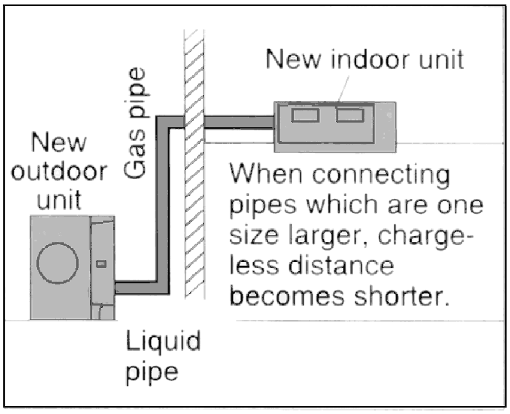


■Can be installed on the side continuously (Depth 320) (unit: mm)

(Height: 1220)
(Height: 900)
(Width: 900)
•24BB - 28BB models
(Width: 900)
• 34BB model
(Width: 1100)
•43BB - 50BB models

2.3.1. Pipes that are one size larger can also be connected for renewal

- If renewing the system, existing refrigerant pipes can be utilized so that only the indoor units need to be replaced.



New indoor unit
Gas pipe
New outdoor unit
Liquid pipe

When connecting pipes which are one size larger, charge-less distance becomes shorter.

- For example, liquid and gas pipes from 10 years ago can be connected to current pipes with the same size for one size larger.

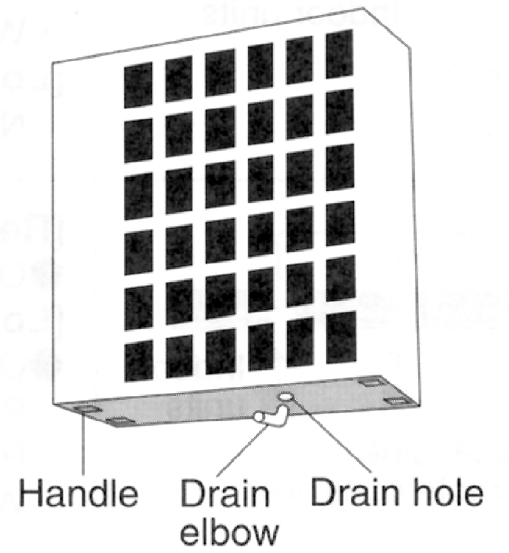
Effective utilization of materials reduces working time and trouble. (Adaptor sockets are not supplied.)

2.3.2. Additional refrigerant charging unnecessary for 30 m

- All models do not require any additional charging of refrigerant for 30 m of pipe length. This makes installation much easier.

2.3.3. Drain water dripping-prevention structure

- The base of the outdoor unit is provided with a single drain hole in order to prevent drain water from leaking out of the unit. Body connecting a drain elbow and a discharge pipe, water leakages can be prevented even when the unit is installed against a wall.



2.3.4. Space saving design allows units to be installed side by side continuously

- Servicing after installation can be carried-out by removing the front covers.

2.3.5. Easy test operation

- Test operation can be carried out for both indoor and outdoor units.

2.3.6. Long pipe design

Max piping length: 50 (m)	**24BB~50BB**
Height difference/ equivalent pipe length	**30/50**

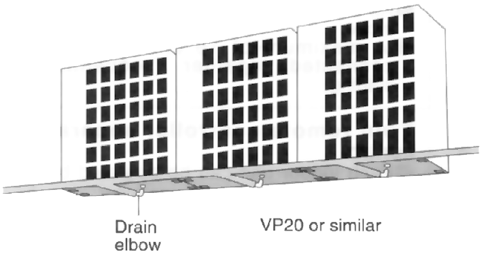
2.3.7. Internal pipe connection

- Pipes are connected inside the units (inside the side covers), making the final appearance more attractive.
- Pipes can be diverted outward in any of four directions (forward, right, down, rear).
- Small liquid pipe diameters of 9.52mm for 43BB and 50BB models, making installation work much easier.

■ Liquid-side pipe diameters (mm) : 9.52 (43BB~50BB / models)

2.3.8. Centralized draining method

- Even when multiple outdoor units are installed to a wall, the drain outlets can be concentrated into a single drain pipe. This makes installation easier and also improve appearance.

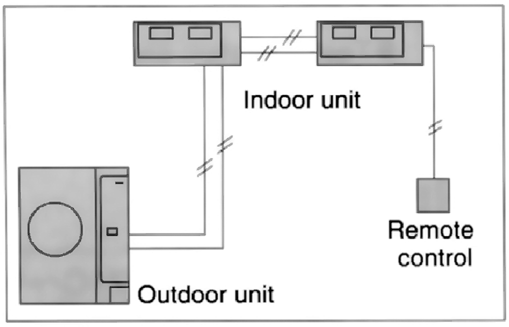


2.4. A brand-new control method using the latest in technology

2.4.1. Power supply wiring is also easier

Power supply wiring and other wiring tasks can be carried out more easily.

- Twin non-polar wires used to connect indoor and outdoor units.
- Adoption of connection error prevention circuits for drives wires and signal wires. If a connection error is made, the relay does not operate and current does not flow to the circuit boards.



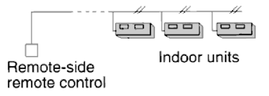
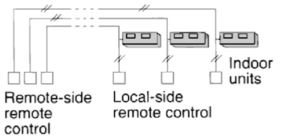
2.4.2. Separate indoor/outdoor unit power supplies

The power supply can be connected to (1) just the outdoor units, or (2) to both indoor and outdoor units.

2.4.3. Automatic setting initialization function (Remote control and Indoor unit)

In accordance with the indoor and outdoor units connected and the connection methods, conditions such as the configuration (twin or triple format) and remote-control functions such as cooling only or heat pump model are automatically detected and set instantly.

2.4.4. Group control equipment

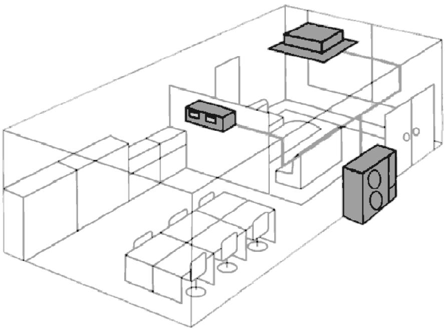
Wired remote control	**Group control by one remote control** ●All air conditioner units are controlled as a whole by remote control. ●All indoor units operate in the same mode. ● A maximum of 16 units can be connected together (sequential starting)		**[Remote side]** ●Optional wired remote control Parts No. · Remote control CZ-RD51P **[Local side]** Not needed
	Twin remote control separate control ●Each indoor unit can be operated by either one of the two remote control. ●Apart from timer setting time, displays for two remote control are identical. ●Last button pressed has priority (main or slave is set at remote control unit).	 Remote-side remote control Local-side remote control Indoor units	**[Remote side]** ●Optional wired remote control **[Local side]** ●Optional wired remote control Parts No. · Remote control CZ-RD51P

2.4.5. Twin and Triple operation

- Simultaneous air conditioning of wide spaces and corners is possible. Indoor units of different horsepowers and models can even be used in combination.

- Master unit and slave-units can be set automatically in twin and triple systems. No address setting is necessary.

- Multiple indoor units can be operated simultaneously with a single remote control. Note that individual operation is not possible.



■ **Twin and Triple combination table**

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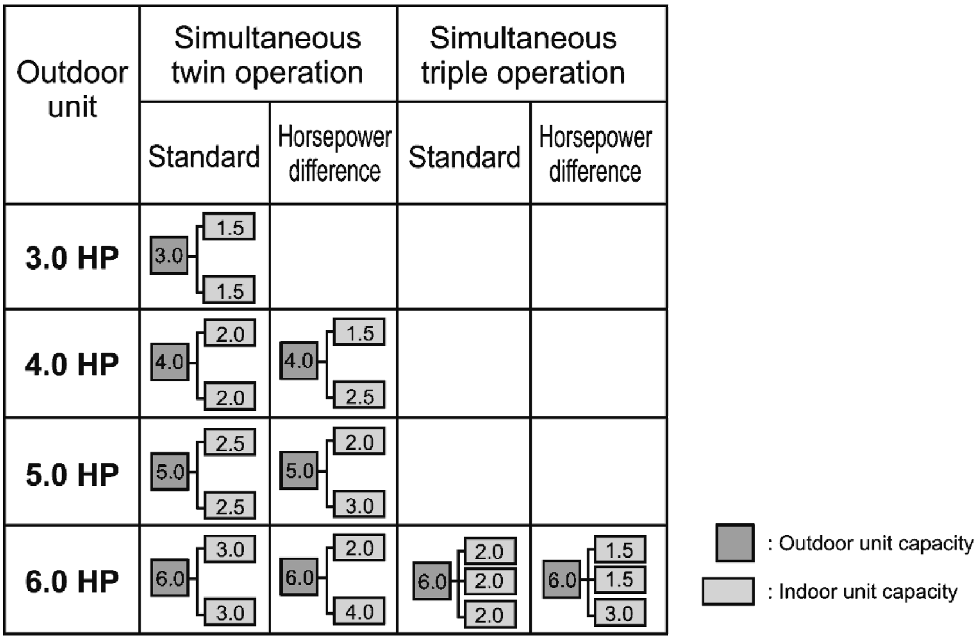


Outdoor unit	Simultaneous twin operation		Simultaneous triple operation	
	Standard	Horsepower difference	Standard	Horsepower difference
3.0 HP	3.0 1.5 1.5			
4.0 HP	4.0 2.0 2.0	4.0 1.5 2.5		
5.0 HP	5.0 2.5 2.5	5.0 2.0 3.0		
6.0 HP	6.0 3.0 3.0	6.0 2.0 4.0	6.0 2.0 2.0 2.0	6.0 1.5 1.5 3.0

■ : Outdoor unit capacity

□ : Indoor unit capacity

3. SPECIFICATION (HEAT PUMP TYPE)

3.1 CS-A24BD1P / CU-A24BBP5

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-A24BD1P	CU-A24BBP5
Cooling Capacity			kW (BTU/h)	6.50 (22,200)	
Heating Capacity			kW (BTU/h)	7.30 (24,900)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Medium and Low Speed			m^3/min cfm	Hi 20 Hi 706	Hi 43 1518
External Static Pressure			mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29	-
Air Inlet				Backward Suction	Rear sided Sucti
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	290 x (1000 + 100) x 500	900 x 900 x 32
Net Weight			kg (lbs)	43 (95)	80 (176)
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type	
		Liquid	mm (inch)	O.D Ø 6.35 (1/4) Flared Type	
	Drain		mm	Female screw RC1 (PT1)	I.DØ 20 x 1

Compressor	Type, Number of Set			-	Hermetic-1 (Rotar
	Starting Method			-	Direct on-line star
	Motor	Type		-	2-pole single pha induction moto
		Input	kW	-	Cool/Heat 2.31/2.
		Rated Output	kW	-	1.9
Fan	Type, Number of Set			Sirocco fan-2	Prop. fan-1
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single pha induction moto
		Input	kW	0.15	0.11
		Rated Output	kW	0.150	0.05
Air-heat Exchanger				Louvre-fin type	Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MS32 (1.3)
Refrigerant (Charged)			kg (oz)	-	R-22 2.5 (88)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermost F.M, Drain over-flow switch, Crankcase heater, Hi pressure switch, Current Transformer	
Noise Level (Sound Pressure)			dB (A)	Hi 45 Lo 43	Cooling 50, Heatin

1. Cooling capacities are based on indoor temp. 27°C D.B (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)
2. Heating capacities are based on indoor temp. 20° CD.B (68.0° FD.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A24BD1P/CU-A24BBP5		
			Condition by JIS B 8616		
Volts	V		220	230	240
Phase			Single	Single	Single
Input Power	kW	Cool	2.70	2.70	2.70
		Heat	2.60	2.60	2.60
Running Current	A	Cool	12.5	12.0	11.8
		Heat	11.9	11.6	11.5
Starting Current	A		49	51	52
Power Factor	%	Cool	98	98	95
		Heat	99	97	94
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 1~220V, 230V, 240V 50Hz		

3.2 CS-A28BD1P / CU-A28BBP5

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-A28BD1P	CU-A28BBP5
Cooling Capacity			kW (BTU/h)	7.30 (24,900)	
Heating Capacity			kW (BTU/h)	8.25 (28,100)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Medium and Low Speed			m3/min cfm	Hi 30 Hi 1059	Hi 43 1518
External Static Pressure			mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29	-
Air Inlet				Backward Suction	Rear sided Sucti
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	360 x (1000 + 10) x 650	900 x 900 x 32
Net Weight			kg (lbs)	53 (117)	82 (181)
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type	
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type	
	Drain		mm	Female screw (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Rotar
	Starting Method			-	Direct on-line star
	Motor	Type		-	2-pole single pha induction moto
		Input	kW	-	Cool/Heat 2.49/2.
		Rated Output	kW	-	2.0

Fan	Type, Number of Set			Sirocco fan-2	Prop. fan-1
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single pha induction moto
		Input	kW	0.20	0.11
		Rated Output	kW	0.20	0.05
Air-heat Exchanger				Louvre-fin type	Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MS32 (1.3)
Refrigerant (Charged)			kg (oz)	-	R-22 3.8 (134)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermost F.M, Drain over-flow switch, Crankcase heater, Hi pressure switch, Current Transformer	
Noise Level (Sound Pressure)			dB (A)	Hi 46 Lo 42	Cooling 50, Heatin

1. Cooling capacities are based on indoor temp. 27°C D.B (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)
2. Heating capacities are based on indoor temp. 20° CD.B (68.0° FD.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A28BD1P/CU-A28BBP5		
			Condition by JIS B 8616		
Volts	V		220	230	240
Phase			Single	Single	Single
Input Power	kW	Cool	2.98	2.98	2.98
		Heat	2.78	2.78	2.78
Running Current	A	Cool	13.7	13.1	12.6
		Heat	12.7	12.2	11.7
Starting Current	A		50	52	54
Power Factor	%	Cool	99	99	99
		Heat	96	99	99
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 1~220V, 230V, 240V 50Hz		

3.3 CS-A28BD1P / CU-A28BBP8

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-A28BD1P	CU-A28BBP8
Cooling Capacity			kW (BTU/h)	7.30 (24,900)	
Heating Capacity			kW (BTU/h)	7.75 (26,400)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Medium and Low Speed			m^3/min cfm	Hi 30 Hi 1059	Hi 43 1518
External Static Pressure			mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29	-
Air Inlet				Backward Suction	Rear sided Sucti
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	360 x (1000 + 10) x 650	900 x 900 x 32
Net Weight			kg (lbs)	53 (117)	82 (181)
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type	
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type	
	Drain		mm	Female screw (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Rotar
	Starting Method			-	Direct on-line star
	Motor	Type		-	2-pole single pha induction moto
		Input	kW	-	Cool/Heat 2.49/2.
		Rated Output	kW	-	2.0
Fan	Type, Number of Set			Sirocco fan-2	Prop. fan-1
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single pha induction moto
		Input	kW	0.20	0.11
		Rated Output	kW	0.20	0.05
Air-heat Exchanger				Louvre-fin type	Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MS32 (1.3)
Refrigerant (Charged)			kg (oz)	-	R-22 3.8 (134)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Head Thermostat for compressor, Internal thermost F.M, Crankcase heater, High pressure switch, Cur Transformer, Drain over-flow switch	
Noise Level (Sound Pressure)			dB (A)	Hi 46 Lo 42	Cooling 50, Heatin

1. **Cooling capacities are based on indoor temp. 27°C D.B (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.), and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**
2. **Heating capacities are based on indoor temp. 20° CD.B (68.0° FD.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)**

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A28BD1P, CU-A28BBP8		
			Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	2.98	2.98	2.98
		Heat	2.78	2.78	2.78
Running Current	A	Cool	5.6	5.3	5.1
		Heat	5.2	4.90	4.8
Starting Current	A		28	29	30
Power Factor	%	Cool	81	81	81
		Heat	81	82	81
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

3.4 CS-A34BD1P / CU-A34BBP5

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-A34BD1P	CU-A34BBP5
Cooling Capacity			kW	10.45	
			(BTU/h)	(35,600)	
Heating Capacity			kW	11.40	
			(BTU/h)	(38,900)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Medium and Low Speed			m3/min	Hi 40	Hi 70
			cfm	Hi 1413	2471
External Static Pressure			mmAq	Hi 5 Me 4 Lo 3	-
			Pa	Hi 49 Me 39 Lo 29	
Air Inlet				Backward Suction	Rear sided Sucti
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	430 x (1000 + 10) x 650	1220 x 900 x 32
Net Weight			kg (lbs)	56 (123)	97 (214)
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type	
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type	
	Drain		mm	Female screw (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Scroll
	Starting Method			-	Direct on-line star
	Motor	Type		-	2-pole single pha induction moto
		Input	kW	-	Cool/Heat 3.23/3.
		Rated Output	kW	-	2.92
Fan	Type, Number of Set			Sirocco fan-3	Prop. fan-2
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single pha induction moto
		Input	kW	0.22	0.24
		Rated Output	kW	0.25	0.05 x 2
Air-heat Exchanger				Louvre-fin type	Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	SONTEX 200LT (
Refrigerant (Charged)			kg (oz)	-	R-22 4.2 (148)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermost F.M, Drain over-flow switch, Crankcase heater, Hi pressure switch, Current Transformer	
Noise Level (Sound Pressure)			dB (A)	Hi 47 Lo 45	Cooling 55, Heatin

1. Cooling capacities are based on indoor temp. 27°C D.B (80.6°F

D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

2. Heating capacities are based on indoor temp. 20° CD.B (68.0° FD.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A34BD1P/CU-A34BBP5		
			Condition by JIS B 8616		
Volts	V		220	230	240
Phase			Single	Single	Single
Input Power	kW	Cool	3.8	3.8	3.8
		Heat	3.55	3.55	3.55
Running Current	A	Cool	19.0	19.1	19.2
		Heat	17.9	18.0	18.1
Starting Current	A		94	99	103
Power Factor	%	Cool	91	87	82
		Heat	90	86	82
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 1~220V, 230V, 240V 50Hz		

3.5 CS-A34BD1P / CU-A34BBP8

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-A34BD1P	CU-A34BBP8
Cooling Capacity			kW (BTU/h)	10.45 (35,600)	
Heating Capacity			kW (BTU/h)	11.40 (38,900)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Medium and Low Speed			m^3/min	Hi 40	Hi 70
			cfm	Hi 1413	2471
External Static Pressure			mmAq	Hi 5 Me 4 Lo 3	-
			Pa	Hi 49 Me 39 Lo 29	
Air Inlet				Backward Suction	Rear sided Sucti
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	430 x (1000 + 10) x 650	1220 x 900 x 32
Net Weight			kg (lbs)	56 (123)	97 (214)
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type	
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type	
	Drain		mm	Female screw (PT1)	I.DØ 20 x 1

Compressor	Type, Number of Set			-	Hermetic-1 (Scroll
	Starting Method			-	Direct on-line star
	Motor	Type		-	2-pole single pha induction moto
		Input	kW	-	Cool/Heat 2.93/3.
		Rated Output	kW	-	2.8
Fan	Type, Number of Set			Sirocco fan-3	Prop. fan-2
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single pha induction moto
		Input	kW	0.40	0.24
		Rated Output	kW	0.25	0.05 x 2
Air-heat Exchanger				Louvre-fin type	Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	SONTEX 200LT (
Refrigerant (Charged)			kg (oz)	-	R-22 4.2 (148)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermost F.M, Drain over-flow switch, Crankcase heater, Hi pressure switch, Current Transformer	
Noise Level (Sound Pressure)			dB (A)	Hi 47 Lo 45	Cooling 55, Heatin

1. **Cooling capacities are based on indoor temp. 27°C D.B (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**
2. **Heating capacities are based on indoor temp. 20° CD.B (68.0° FD.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)**

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A34BD1P/CU-A34BBP8		
			Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	3.65	3.65	3.65
		Heat	3.55	3.55	3.55
Running Current	A	Cool	6.5	6.5	6.5
		Heat	6.1	6.1	6.1
Starting Current	A		39	41	42
Power Factor	%	Cool	85	81	78
		Heat	88	84	81
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

3.6 CS-A43BD1P / CU-A43BBP8

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-A43BD1P	CU-A43BBP8
Cooling Capacity			kW (BTU/h)	13.00 (44,300)	
Heating Capacity			kW (BTU/h)	14.50 (49,400)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Medium and Low Speed			m3/min cfm	Hi 50 Hi 1766	Hi 82 2895
External Static Pressure			mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29	-
Air Inlet				Backward Suction	Rear sided Sucti
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	430 x (1000 + 10) x 650	1220 x 1100 x 32
Net Weight			kg (lbs)	57 (126)	114 (251)
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type	
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type	
	Drain		mm	Female screw (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Scroll
	Starting Method			-	Direct on-line star
	Motor	Type		-	2-pole 3 phase indu motor
		Input	kW	-	Cool/Heat 3.85/3.
		Rated Output	kW	-	3.54

Fan	Type, Number of Set			Sirocco fan-4	Prop. fan-2
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single pha induction moto
		Input	kW	0.55	0.23
		Rated Output	kW	0.35	0.055 x 2
Air-heat Exchanger				Louvre-fin type	Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	SONTEX 200LT (
Refrigerant (Charged)			kg (oz)	-	R-22 5.2 (183)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermost F.M, Drain over-flow switch, Crankcase heater, Hi pressure switch, Current Transformer	
Noise Level (Sound Pressure)			dB (A)	Hi 50 Lo 49	Cooling 55 Heatin

1. Cooling capacities are based on indoor temp. 27°C D.B (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)
2. Heating capacities are based on indoor temp. 20° CD.B(68.0° FD.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A43BD1P/CU-A43BBP8		
			Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	4.53	4.35	4.53
		Heat	3.90	3.90	3.90
Running Current	A	Cool	7.8	7.8	7.8
		Heat	6.1	6.1	6.1
Starting Current	A		58	58	58
Power Factor	%	Cool	88	84	81
		Heat	97	92	89
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

3.6 CS-A50BD1P / CU-A50BBP8

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-A50BD1P	CU-A50BBP8
Cooling Capacity			kW (BTU/h)	14.50 (49,400)	
Heating Capacity			kW (BTU/h)	15.70 (53,500)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Medium and Low Speed			m3/min cfm	Hi 60 Hi 2119	Hi 86 3036
External Static Pressure			mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29	-
Air Inlet				Backward Suction	Rear sided Sucti
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	430 x (1000 + 10) x 650	1220 x 1100 x 32
Net Weight			kg (lbs)	60 (132)	116 (256)
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type	
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type	
	Drain		mm	Female screw (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Scroll
	Starting Method			-	Direct on-line star
	Motor	Type		-	2-pole 3-phase indu motor
		Input	kW	-	Cool/Heat 4.56/4.
		Rated Output	kW	-	4.1
Fan	Type, Number of Set			Sirocco fan-4	Prop. fan-2
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single pha induction moto
		Input	kW	0.71	0.25
		Rated Output	kW	0.45	0.055X2
Air-heat Exchanger				Louvre-fin type	Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	SONTEX 200LT (
Refrigerant (Charged)			kg (oz)	-	R-22 5.0 (176)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermost F.M, Drain over-flow switch, Crankcase heater, Hi pressure switch, Current Transformer	
Noise Level (Sound Pressure)			dB (A)	Hi 52 Lo 51	Cooling 56 Heatin

1. **Cooling capacities are based on indoor temp. 27°C D.B (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**
2. **Heating capacities are based on indoor temp. 20° CD.B (68.0° FD.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)**

ELECTRICAL DATA (50Hz)

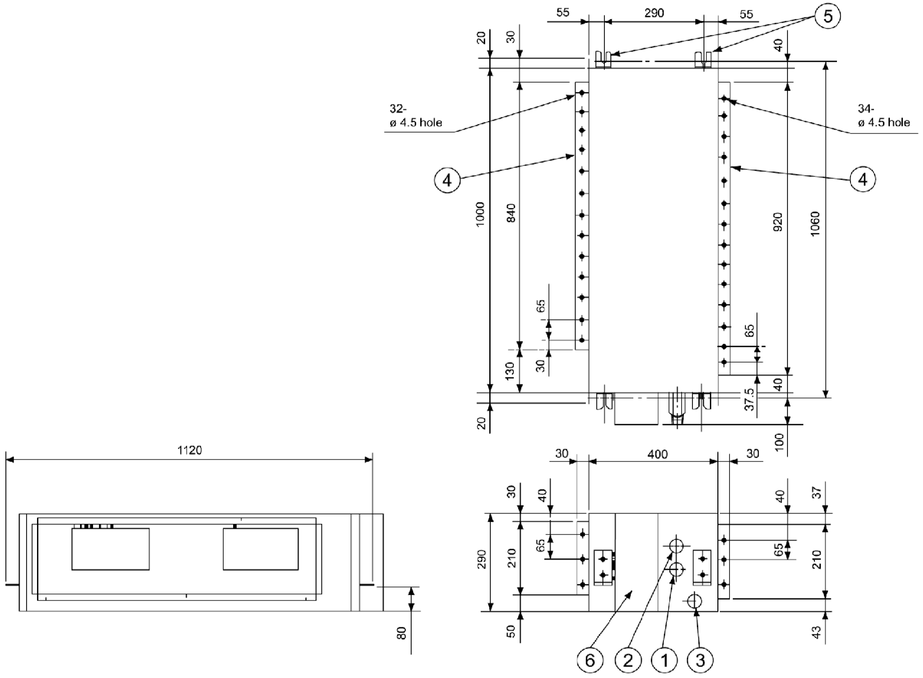
MODEL / ITEM			CS-A50BD1P/CU-A50BBP8		
			Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	5.72	5.72	5.72
		Heat	5.03	5.03	5.03
Running Current	A	Cool	9.5	9.5	9.5
		Heat	8.4	8.4	8.4
Starting Current	A		69	69	69
Power Factor	%	Cool	91	87	84
		Heat	91	86	83
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

4. TECHNICAL DRAWING

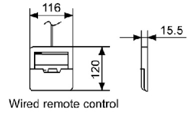
CS-A24BD1P

OUTSIDE DIMENSIONS

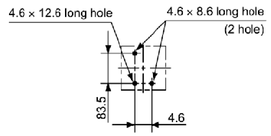
No.	Description	Dimension
7	Remote control unit	
6	Control box	
5	Hanger	
4	Duct connection	
3	Drain pipe connection	Female screw PT1
2	Pipe connection (liquid)	O.D ø 6.35 (1/4) Flared
1	Pipe connection (gas)	O.D ø 15.88 (5/8) Flared



55
290
55
⑤
20
30
40
32-
ø 4.5 hole
34-
ø 4.5 hole
④
④
1000
840
920
1060
65
65
130
30
40
37.5
20
100
1120
30
400
30
30
40
40
37
290
210
65
65
210
50
43
80
⑥
②
①
③

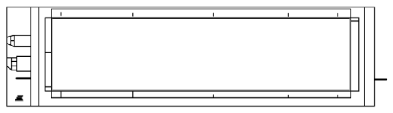


Wired remote control



4.6 × 12.6 long hole
4.6 × 8.6 long hole
(2 hole)
83.5
4.6

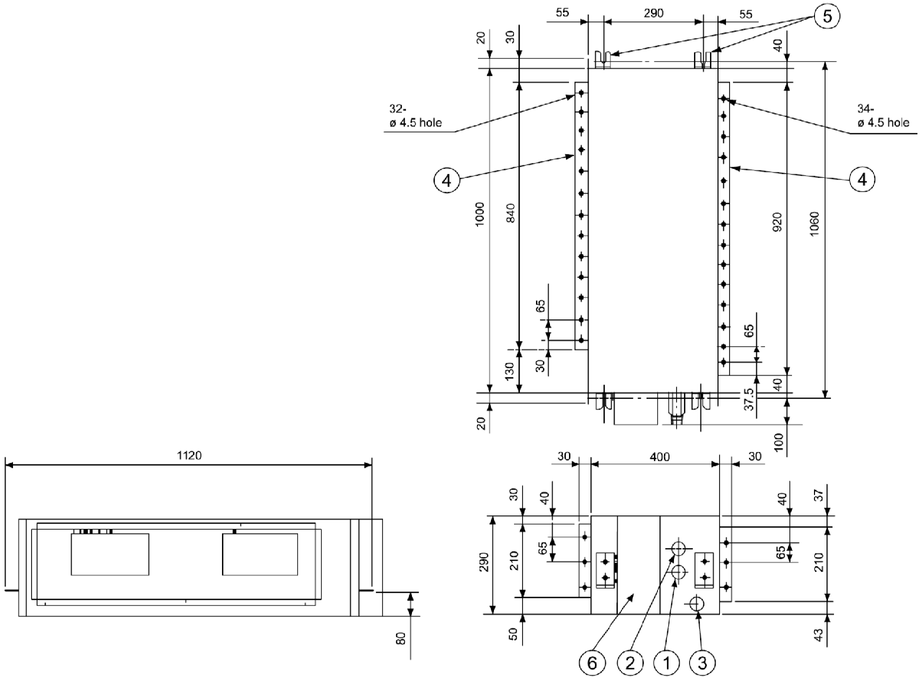
Wireless remote holder attachment hole position



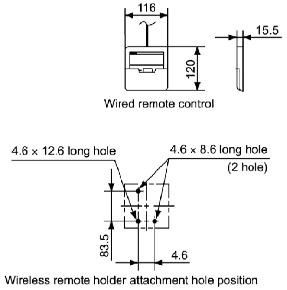
Unit : mm

CS-A28BD1P
OUTSIDE DIMENSIONS

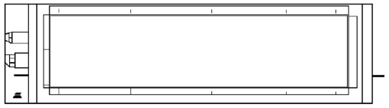
No.	Description	Dimension
7	Remote control unit	
6	Control box	
5	Hanger	
4	Duct connection	
3	Drain pipe connection	Female screw PT1
2	Pipe connection (liquid)	O.D ø 9.52 (3/8) Flared
1	Pipe connection (gas)	O.D ø 15.68 (5/8) Flared



55
290
55
⑤
20
30
40
32-
ø 4.5 hole
34-
ø 4.5 hole
④
④
1000
840
920
1060
65
30
130
65
40
37.5
20
100
1120
80
30
400
30
30
40
65
210
290
50
40
37
65
210
43
⑥
②
①
③



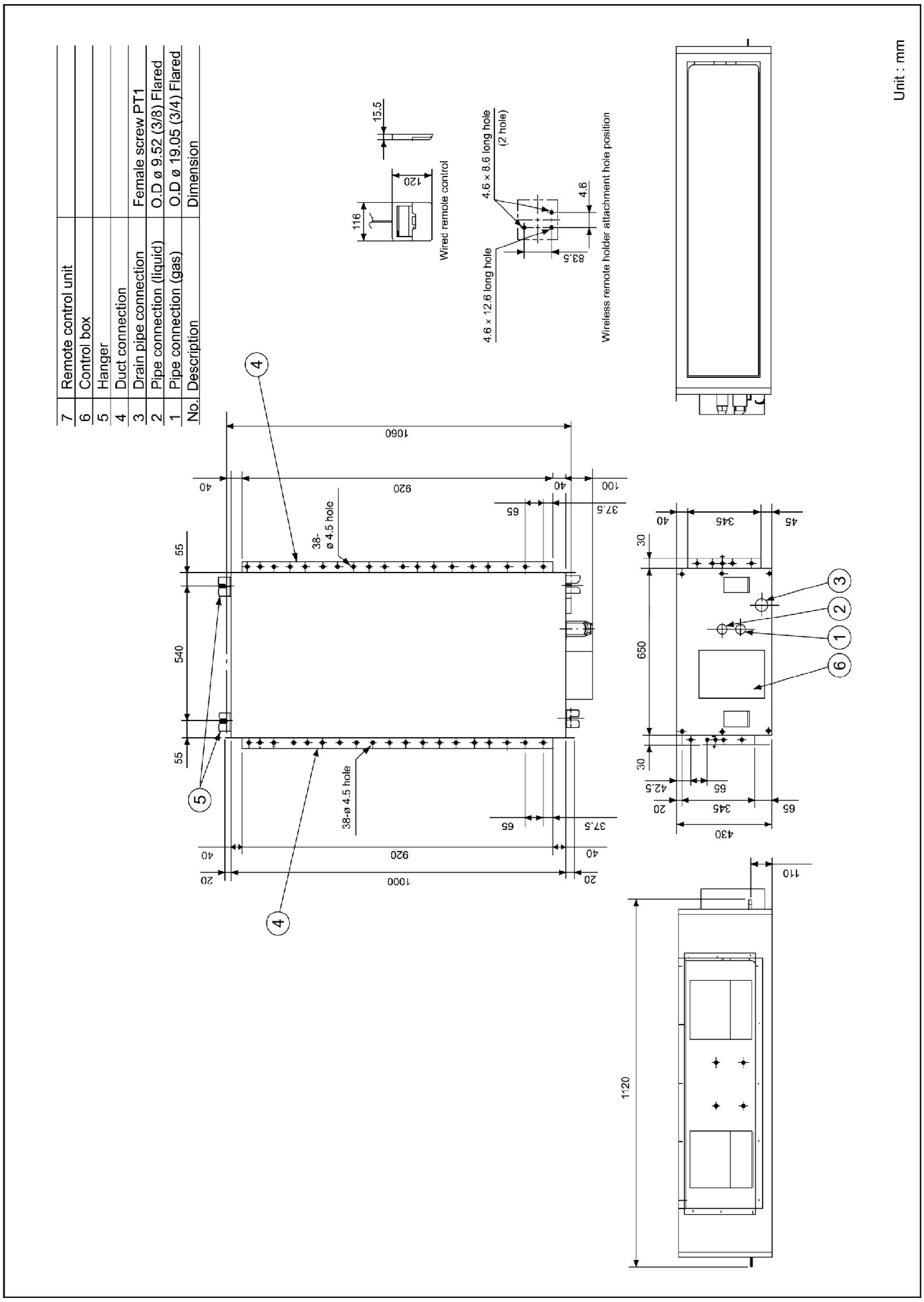
116
15.5
120
Wired remote control
4.6 × 12.6 long hole
4.6 × 8.6 long hole
(2 hole)
83.5
4.6
Wireless remote holder attachment hole position



Unit : mm

CS-A34BD1P

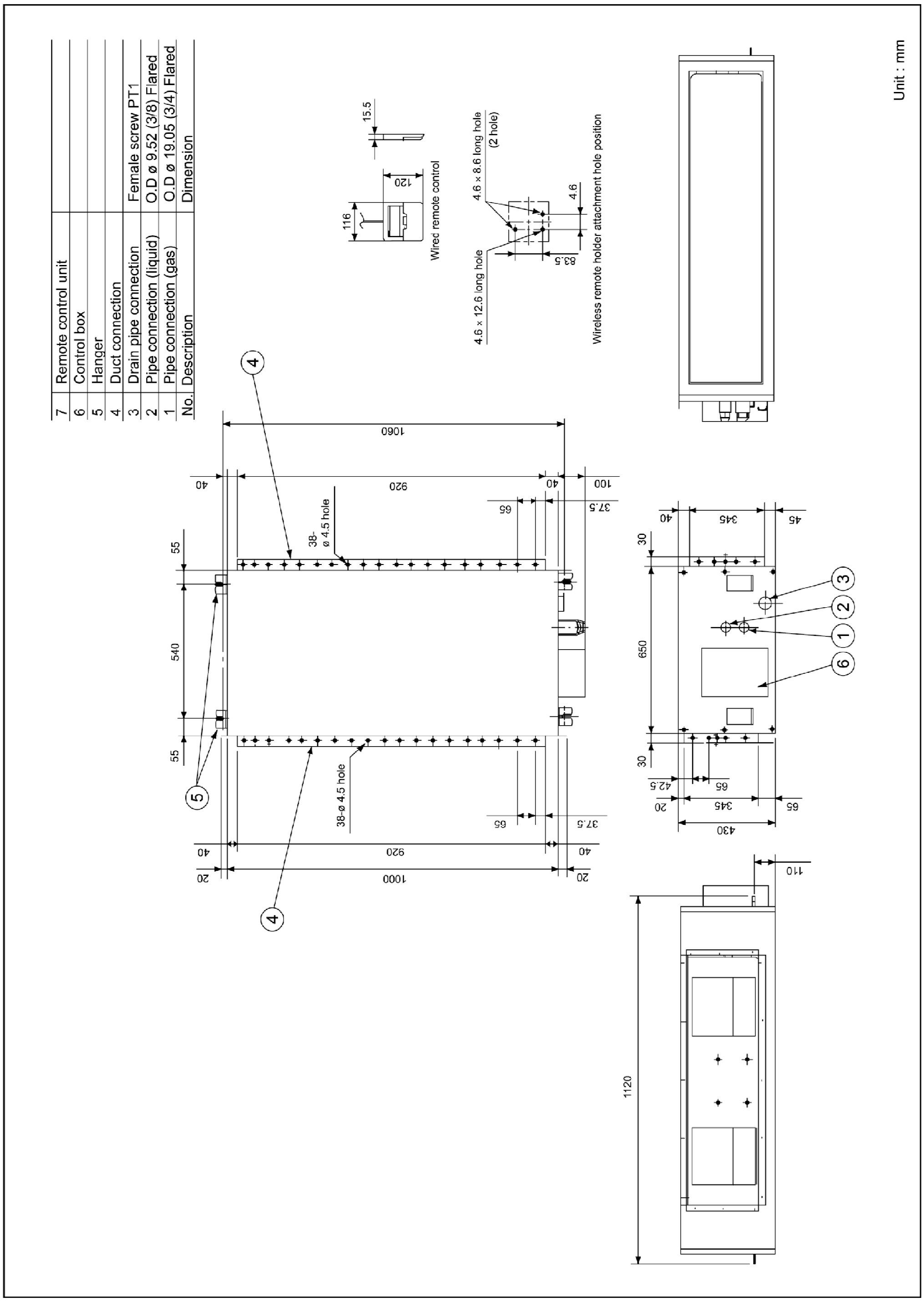
OUTSIDE DIMENSIONS



No.	Description	Dimension
1	Pipe connection (gas)	O.D ø 19.05 (3/4) Flared
2	Pipe connection (liquid)	O.D ø 9.52 (3/8) Flared
3	Drain pipe connection	Female screw PT1
4	Duct connection	
5	Hanger	
6	Control box	
7	Remote control unit	

Unit : mm
Wired remote control
116
120
15.5
4.6 × 12.6 long hole
4.6 × 8.6 long hole
(2 hole)
4.6
83.5
Wireless remote holder attachment hole position
1060
40
920
40
100
65
37.5
38-
ø 4.5 hole
38-ø 4.5 hole
55
540
55
1000
20
20
40
920
40
65
37.5
④
④
⑤
40
345
45
30
650
30
42.5
65
20
345
65
430
①
②
③
⑥
110
1120

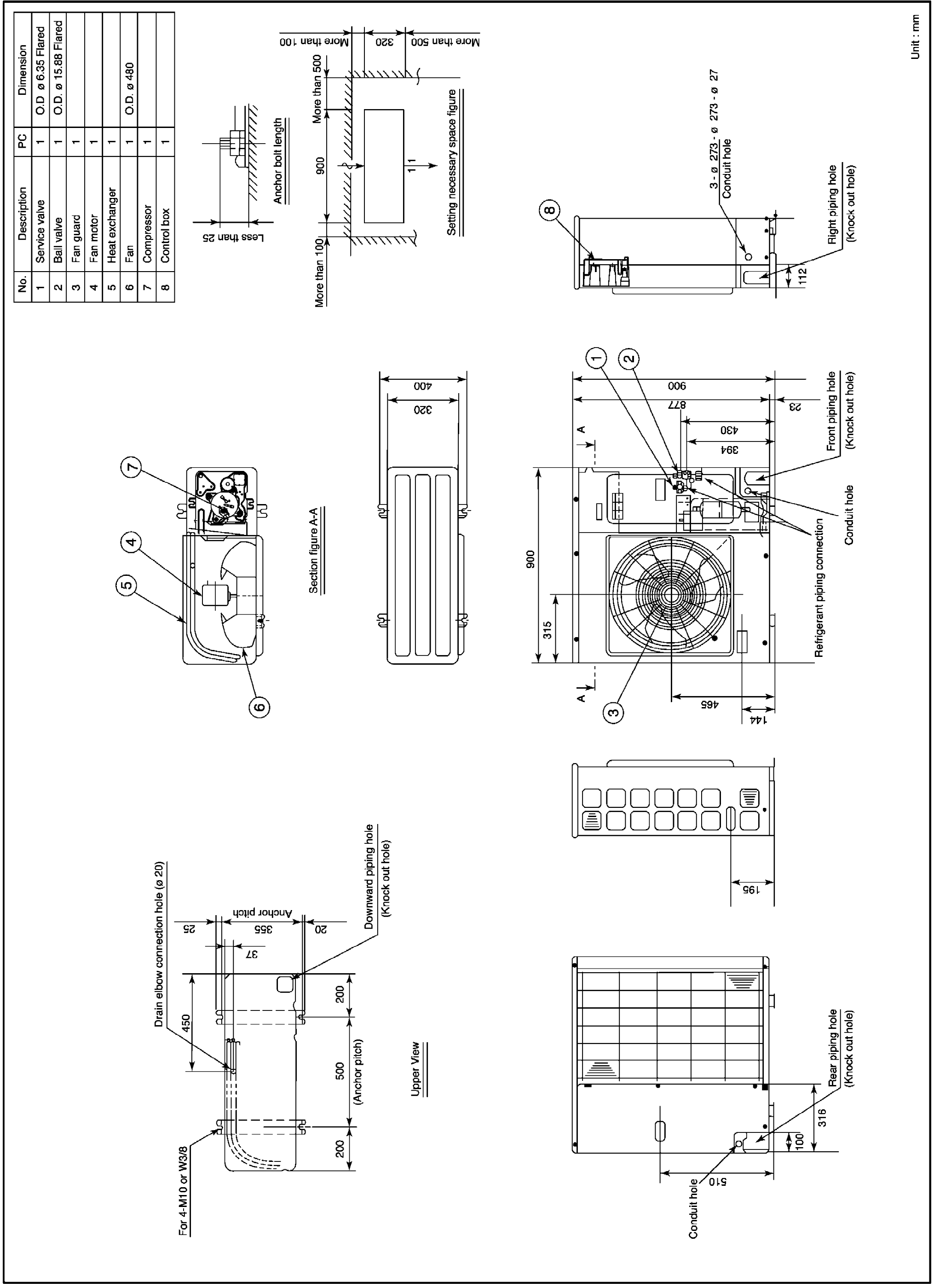
CS-A43BD1P, CS-A50BD1P
OUTSIDE DIMENSIONS



No.	Description	Dimension
7	Remote control unit	
6	Control box	
5	Hanger	
4	Duct connection	
3	Drain pipe connection	Female screw PT1
2	Pipe connection (liquid)	O.D ø 9.52 (3/8) Flared
1	Pipe connection (gas)	O.D ø 19.05 (3/4) Flared

Unit : mm
④
1060
40
920
40
100
65
37.5
38-ø 4.5 hole
55
540
55
⑤
38-ø 4.5 hole
65
37.5
40
920
40
20
1000
20
④
116
120
15.5
Wired remote control
4.6 × 8.6 long hole (2 hole)
4.6 × 12.6 long hole
4.6
83.5
Wireless remote holder attachment hole position
40
345
45
30
650
30
③
②
①
⑥
42.5
65
20
345
65
430
110
1120

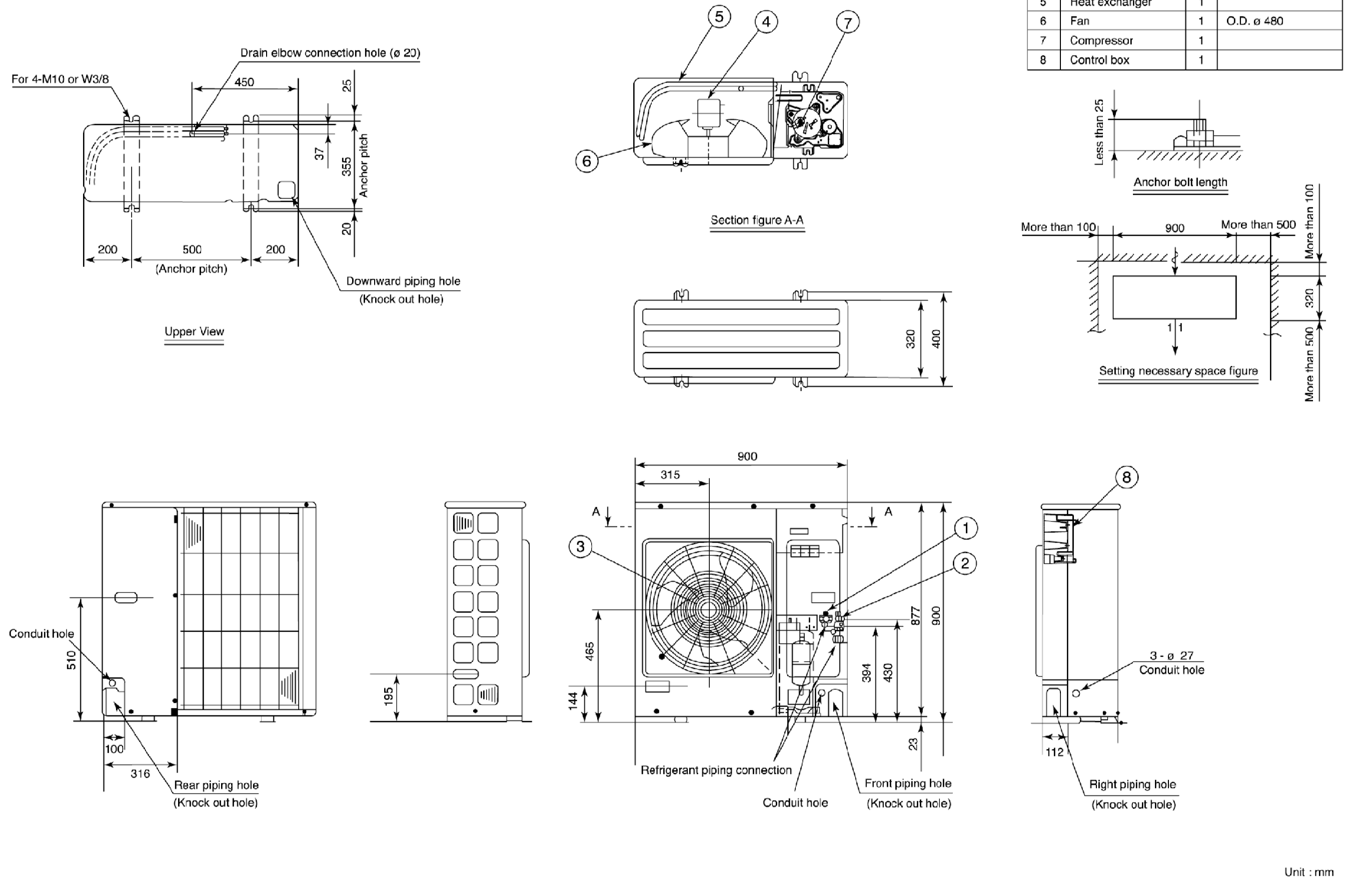
CU-C24BBP5 , CU-C24BBP5



No.	Description	PC	Dimension
1	Service valve	1	O.D ø 6.35 Flared
2	Ball valve	1	O.D. ø 15.88 Flared
3	Fan guard	1	
4	Fan motor	1	
5	Heat exchanger	1	
6	Fan	1	O.D. ø 480
7	Compressor	1	
8	Control box	1	

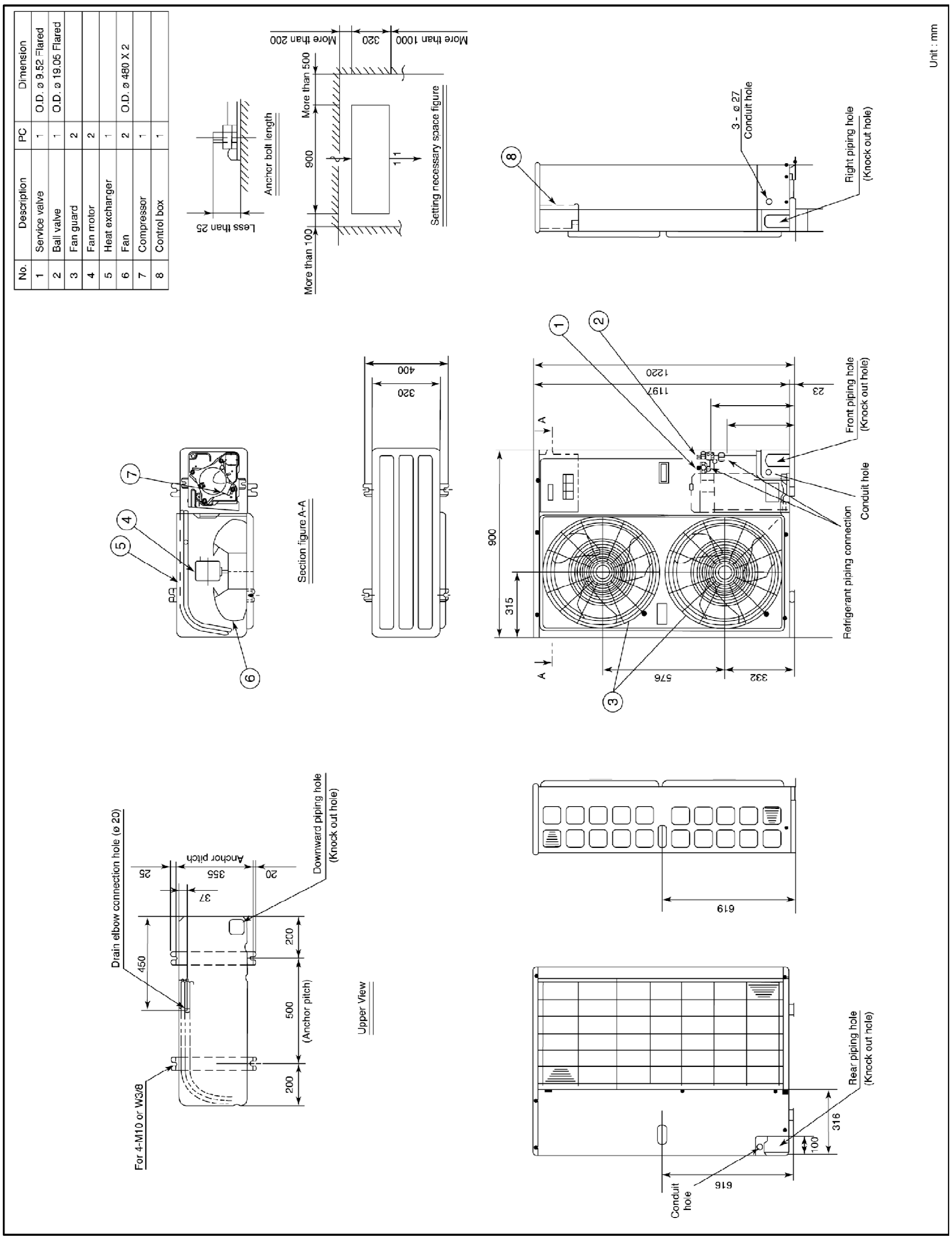
Less than 25
Anchor bolt length
More than 100
More than 500
320
900
Setting necessary space figure
Section figure A-A
400
320
Drain elbow connection hole (ø 20)
450
25
355
20
37
Anchor pitch
Downward piping hole
(Knock out hole)
200
500
(Anchor pitch)
200
For 4-M10 or W3/8
Upper View
3 - ø 273 - ø 273 - ø 27
Conduit hole
Right piping hole
(Knock out hole)
112
900
877
430
394
23
Front piping hole
(Knock out hole)
Conduit hole
Refrigerant piping connection
900
315
465
144
A
A
195
Rear piping hole
(Knock out hole)
316
100
510
Conduit hole
Unit : mm

CU-A28BBP5, CU-A28BBP8,


For 4-M10 or W3/8
Drain elbow connection hole (ø 20)
450
25
37
355
Anchor pitch
20
200
500
(Anchor pitch)
200
Downward piping hole
(Knock out hole)
Upper View
⑤
④
⑦
⑥
Section figure A-A
320
400
Less than 25
Anchor bolt length
More than 100
900
More than 500
More than 100
320
More than 500
Setting necessary space figure
Conduit hole
510
100
316
Rear piping hole
(Knock out hole)
195
900
315
A
A
③
465
144
①
②
877
900
394
430
23
Refrigerant piping connection
Conduit hole
Front piping hole
(Knock out hole)
⑧
3 - ø 27
Conduit hole
112
Right piping hole
(Knock out hole)
Unit : mm

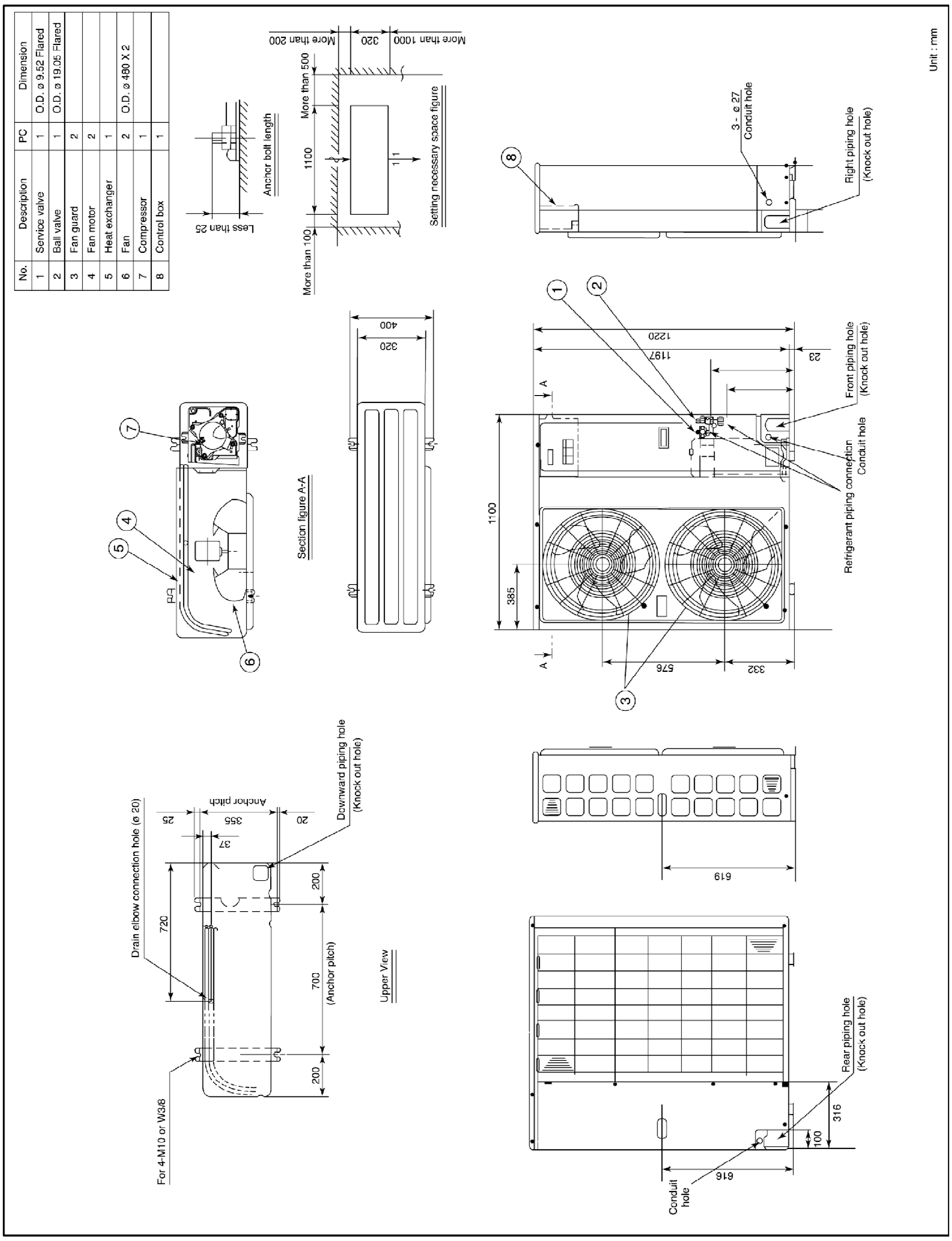
No.	Description	PC	Dimension
1	Service valve	1	O.D ø 9.52 Flared
2	Ball valve	1	O.D. ø 15.88 Flared
3	Fan guard	1	
4	Fan motor	1	
5	Heat exchanger	1	
6	Fan	1	O.D. ø 480
7	Compressor	1	
8	Control box	1	

CU-A34BBP5, CU-C34BBP5, CU-A34BBP8, CU-C34BBP8


Unit : mm
More than 200
320
More than 1000
More than 500
900
More than 100
Setting necessary space figure
Less than 25
Anchor bolt length
3 - ø 27
Conduit hole
Right piping hole
(Knock out hole)
Front piping hole
(Knock out hole)
Conduit hole
Refrigerant piping connection
1220
1197
23
900
315
576
332
A
Section figure A-A
400
320
Drain elbow connection hole (ø 20)
For 4-M10 or W3/8
Anchor pitch
25
355
20
37
450
200
500
(Anchor pitch)
200
Downward piping hole
(Knock out hole)
Upper View
619
616
100
316
Rear piping hole
(Knock out hole)
Conduit hole
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

No.	Description	PC	Dimension
1	Service valve	1	O.D. ø 9.52 Flared
2	Ball valve	1	O.D. ø 19.05 Flared
3	Fan guard	2	
4	Fan motor	2	
5	Heat exchanger	1	
6	Fan	2	O.D. ø 480 X 2
7	Compressor	1	
8	Control box	1	

CU-A43BBP8, CU-A50BBP8, CU-C43BBP8, CU-C50BBP8

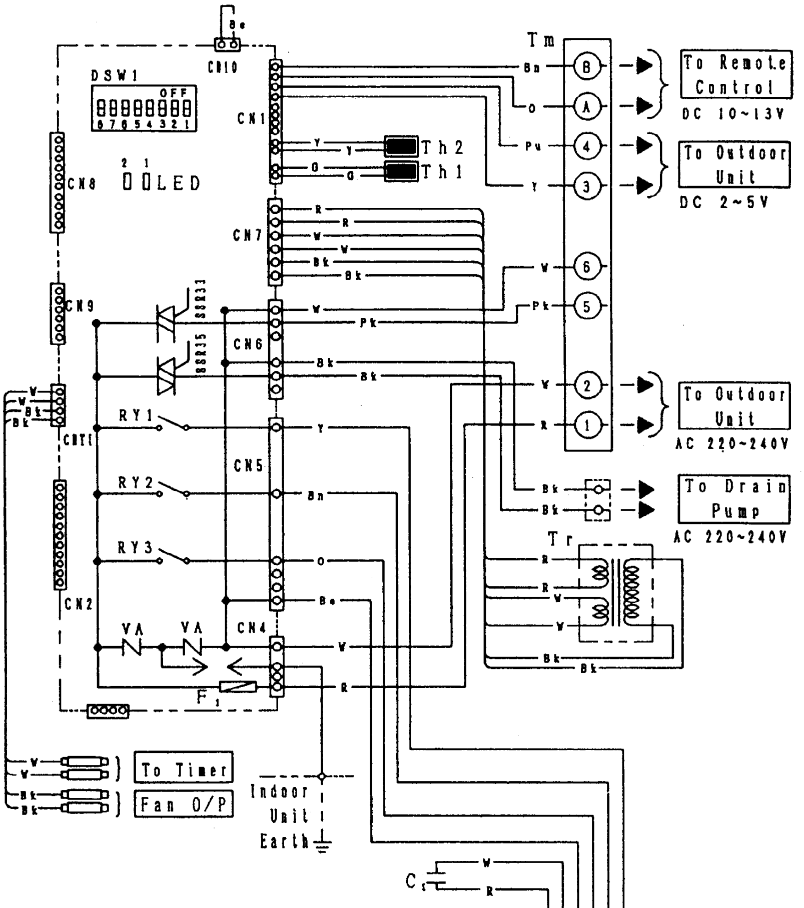

Less than 25
Anchor bolt length
More than 100
1100
More than 500
More than 200
320
More than 1000
Setting necessary space figure
Section figure A-A
400
320
1220
1197
23
1100
385
576
332
A
Front piping hole
(Knock out hole)
Conduit hole
Refrigerant piping connection
3 - ø 27
Conduit hole
Right piping hole
(Knock out hole)
For 4-M10 or W3/8
Drain elbow connection hole (ø 20)
720
25
355
37
20
Anchor pitch
200
700
(Anchor pitch)
Downward piping hole
(Knock out hole)
Upper View
619
616
316
100
Conduit hole
Rear piping hole
(Knock out hole)
Unit : mm
①
②
③
④
⑤
⑥
⑦
⑧

No.	Description	PC	Dimension
1	Service valve	1	O.D. ø 9.52 Flared
2	Ball valve	1	O.D. ø 19.05 Flared
3	Fan guard	2	
4	Fan motor	2	
5	Heat exchanger	1	
6	Fan	2	O.D. ø 480 X 2
7	Compressor	1	
8	Control box	1	

5. CIRCUIT DIAGRAM

CS-A24BD1P, CS-A28BD1P, CS-A34BD1P

CONNECTION DIAGRAM (Indoor Unit)


Be
CN10
DSW1
OFF
8 7 6 5 4 3 2 1
CN1
CN8
2 1
LED
Y
O
Th 2
Th 1
CN7
R
W
Bk
CN9
SSR33
SSR35
CN6
Pk
CNT1
RY1
RY2
RY3
CN5
Bn
O
Be
CN2
VA
VA
CN4
F1
To Timer
Fan O/P
Indoor Unit Earth
Tm
B
A
4
3
6
5
2
1
Pu
To Remote Control
DC 10~13V
To Outdoor Unit
DC 2~5V
To Outdoor Unit
AC 220~240V
To Drain Pump
AC 220~240V
Tr
C1
FM
(49F)

WIRE COLOR

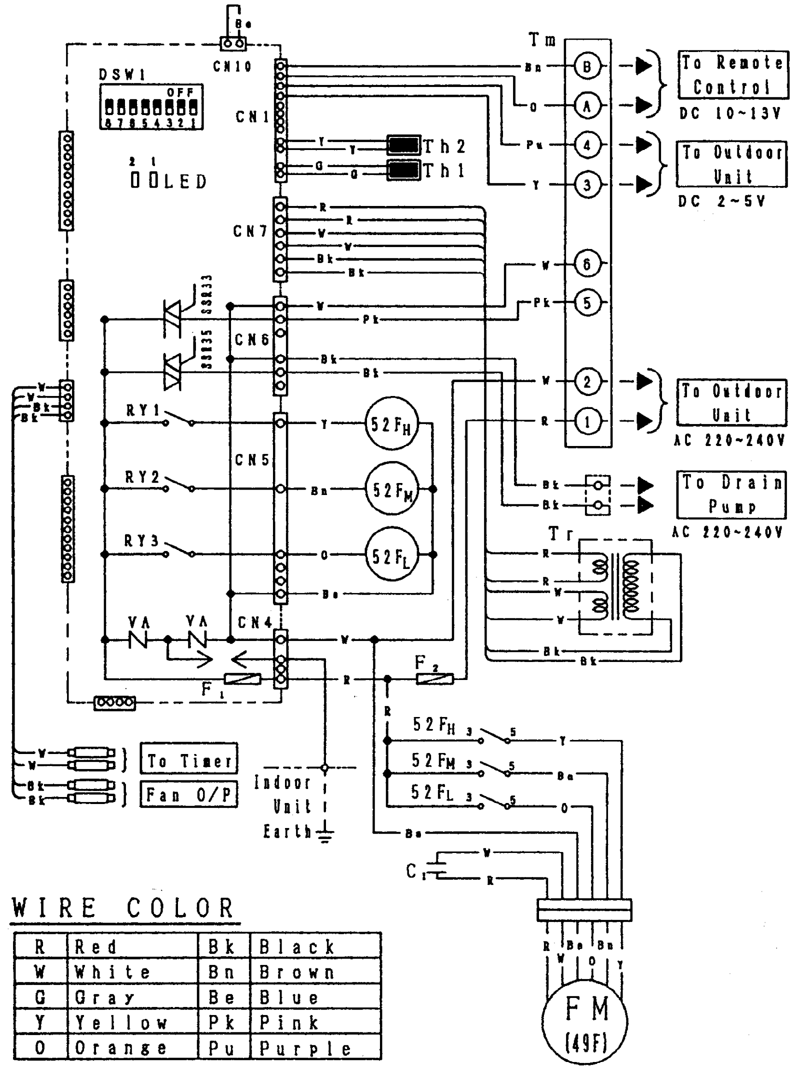
R	Red	Bk	Black
W	White	Bn	Brown
G	Gray	Be	Blue
Y	Yellow	Pk	Pink
O	Orange	Pu	Purple

LEGEND

FM	Fan Motor	49F	Interal Thermostat for FM
VA	Varistor	C_1	Capacitor for FM
Tr	Transformer	Tm	Terminal Board for Control Circuit
F	Fuse	Th1	Thermistor for Indoor Temperature
		Th2	Thermistor for Indoor Piping

CS-A43BD1P, CS-A50BD1P

CONNECTION DIAGRAM (Indoor Unit)


Be
CN10
DSW1
OFF
8 7 6 5 4 3 2 1
CN1
2 1
LED
Th2
Th1
CN7
SSR33
SSR35
CN6
RY1
RY2
RY3
CN5
52FH
52FM
52FL
VA
VA
CN4
F1
F2
Tm
B
A
4
3
6
5
2
1
To Remote Control
DC 10~13V
To Outdoor Unit
DC 2~5V
To Outdoor Unit
AC 220~240V
To Drain Pump
AC 220~240V
Tr
To Timer
Fan O/P
Indoor Unit Earth
52FH 3 5
52FM 3 5
52FL 3 5
C1
FM
(49F)
R Be Bn
W O Y

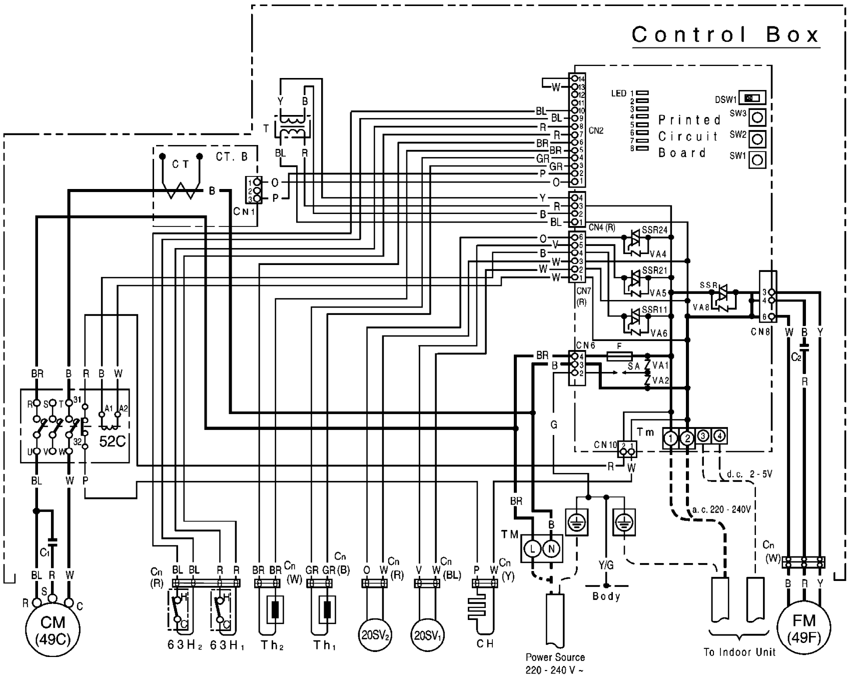
WIRE COLOR

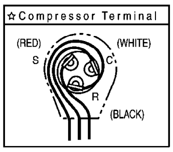
R	Red	Bk	Black
W	White	Bn	Brown
G	Gray	Be	Blue
Y	Yellow	Pk	Pink
O	Orange	Pu	Purple

LEGEND

FM	Fan Motor	49F	Interal Thermostat for FM
VA	Varistor	C_I	Capacitor for FM
Tr	Transformer	Tm	Terminal Board for Control Circuit
F	Fuse	Th1	Thermistor for Indoor Temperature
52F	FM Relay	Th2	Thermistor for Indoor Piping

CU-A24BBP5, CU-A28BBP5


Control Box
Printed Circuit Board
LED 1 2 3 4 5 6 7 8
DSW1
SW3
SW2
SW1
CN2
CN4 (R)
CN7 (R)
CN6
CN8
CN10
CN1
CT. B
CT
T
SSR24
SSR21
SSR11
SSR
VA1
VA2
VA4
VA5
VA6
VA8
SA
F
Tm
① ② ③ ④
d.c. 2 - 5V
a.c. 220 - 240V
52C
A1 A2
31 32
C1
C2
CM (49C)
FM (49F)
63H2
63H1
Th2
Th1
20SV2
20SV1
CH
TM
L N
Y/G
Body
Power Source 220 - 240 V ~
To Indoor Unit
Cn (R)
Cn (W)
Cn (B)
Cn (BL)
Cn (Y)
G


☆Compressor Terminal

(RED)
S
(WHITE)
C
R
(BLACK)

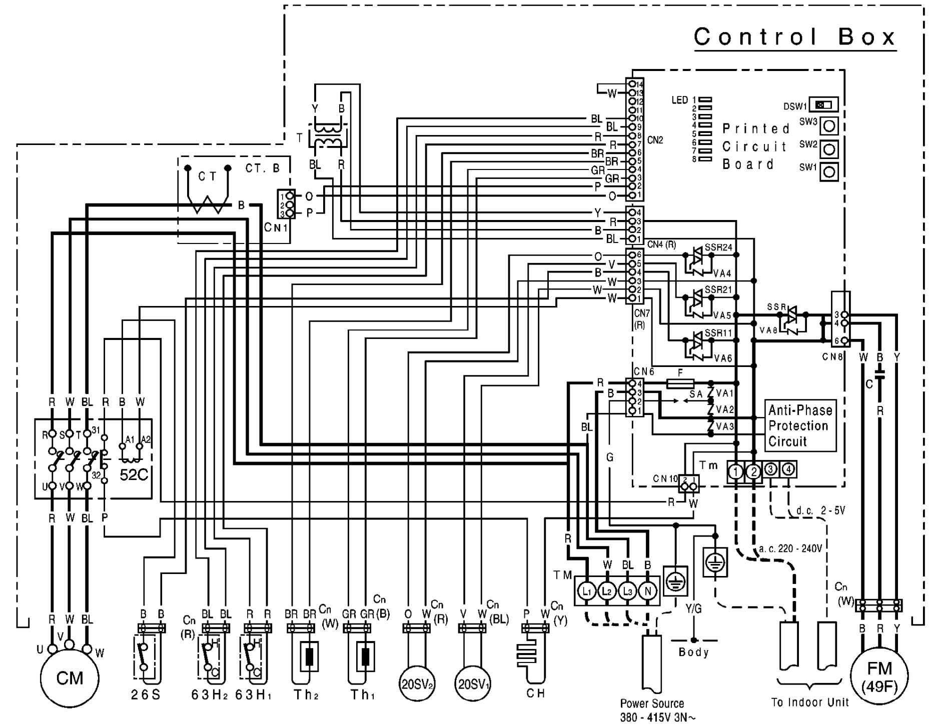
WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

LEGEND

CM	Compressor Motor	$20SV_1$	Reversing Valve	Printed Circuit Board	
FM	Fan Motor (Outdoor Unit)	$20SV_2$	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TM	Terminal Board for Main Circuit	$VA_{1\sim8}$	Varistor
C_1	Capacitor for CM	CT.B	Current Trans Board	F	Fuse 250V T 6.3A
C_2	Capacitor for FM	Th_1	Thermistor (Compressor discharge temp.)	$CN_{1\sim10}$	Connector
CH	Crankcase Heater for CM	Th_2	Thermistor (Heat exchanger outlet temp.)	$SSR_{1,11}$	Solid State Relay
$63H_1$	High Pressure Switch	CT	Current Transformer	$SSR_{21,24}$	Solid State Relay
$63H_2$	High Pressure Switch Heat-pump	Cn	Connector	Tm	Terminal Board for Control Circuit
49C	Internal Protector for CM	T	Transformer		
49F	Internal Protector for FM				

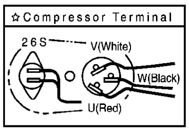
CU-A28BBP8


Control Box
Printed Circuit Board
LED
DSW1
SW3
SW2
SW1
CN2
CN4 (R)
CN7 (R)
CN6
CN8
CN10
CN1
CT
CT. B
T
SSR24
SSR21
SSR11
SSR
VA1
VA2
VA3
VA4
VA5
VA6
VA8
SA
F
Anti-Phase Protection Circuit
Tm
d.c. 2 - 5V
a.c. 220 - 240V
52C
A1 A2
TM
L1 L2 L3 N
Y/G
Body
C
CM
U V W
26S
63H2
63H1
Th2
Th1
20SV2
20SV1
CH
Cn (R)
Cn (W)
Cn (B)
Cn (R)
Cn (BL)
Cn (Y)
Cn (W)
FM (49F)
Power Source 380 - 415V 3N~
To Indoor Unit

WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

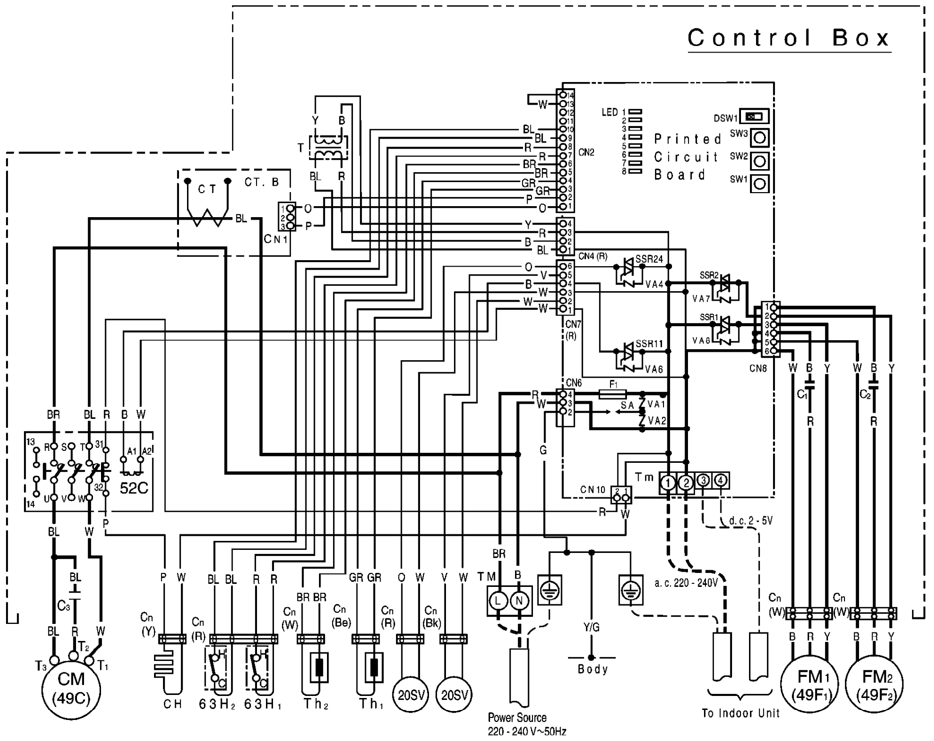
☆Compressor Terminal


26S
V(White)
W(Black)
U(Red)

LEGEND

CM	Compressor Motor	$20SV_1$	Reversing Valve	Printed Circuit Board	
FM	Fan Motor (Outdoor Unit)	$20SV_2$	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TM	Terminal Board for Main Circuit	$VA_{1\sim8}$	Varistor
C	Capacitor for FM	CT.B	Current Trans Board	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	Th_1	Thermistor (Compressor discharger temp.)	$CN_{1\sim10}$	Connector
$63H_1$	High Pressure Switch	Th_2	Thermistor (Heat exchanger outlet temp.)	$SSR_{1,11}$	Solid State Relay
$63H_2$	High Pressure Switch on Heat-pump	CT	Current Transformer	$SSR_{21,24}$	Solid State Relay
Cn	Connector	T	Transformer	Tm	Terminal Board for Control Circuit
49F	Internal Protector for FM	26S	Bimetal Thermostat for OM		

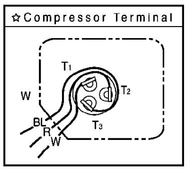
CU-A34BBP5


Control Box
Printed Circuit Board
LED
DSW1
SW3
SW2
SW1
CN2
CN4 (R)
CN7 (R)
CN6
CN8
CN10
CN1
CT
CT. B
T
SSR24
SSR2
SSR1
SSR11
VA4
VA7
VA8
VA6
VA1
VA2
SA
F1
Tm
TM
52C
C1
C2
C3
CM
(49C)
T1
T2
T3
CH
63H2
63H1
Th2
Th1
20SV
20SV
Cn (Y)
Cn (R)
Cn (W)
Cn (Be)
Cn (R)
Cn (Bk)
Cn (W)
FM1 (49F1)
FM2 (49F2)
a. c. 220 - 240V
d. c. 2 - 5V
Y/G
Body
Power Source
220 - 240 V~50Hz
To Indoor Unit

WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

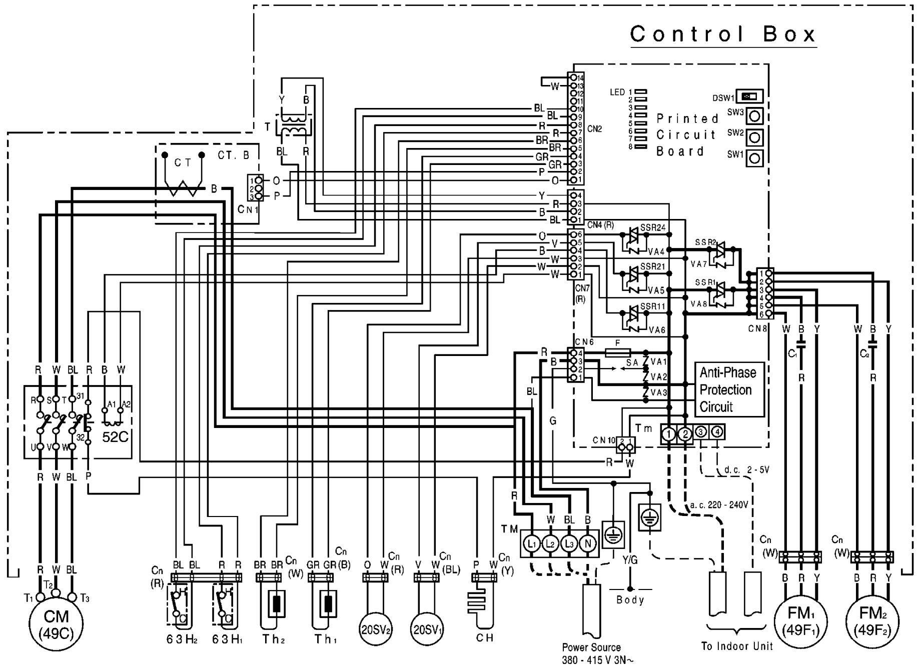
☆Compressor Terminal

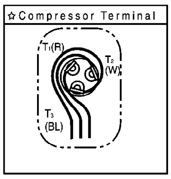

T1
T2
T3
W
BL
R
W

LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit	Printed Circuit Board	
$FM_{1,2}$	Fan Motor (Outdoor Unit)	CT.B	Current Trans Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermistor (Compressor discharge temp.)	$VA_{1\sim8}$	Varistor
$C_{1,2}$	Capactor for FM	Th_2	Thermistor (Heat exchanger outlet temp.)	F_1	Fuse 250V T 6.3A
C_3	Capactor for CM	CT	Current Transformer	$CN_{1\sim10}$	Connector
CH	Crankcase Heater for CM	Cn	Connector	$SSR_{1,2}$	Solid State Relay
$63H_1$	High Pressure Switch	T	Transformer	$SSR_{11,24}$	Solid State Relay
$63H_2$	High Pressure Switch on Heat pump	$20SV_1$	Reversing Valve	Tm	Terminal Board for Control Circuit
49C	Internal Protector for CM	$20SV_2$	Bypass Magnetic Valve		
$49F_{1,2}$	Internal Protector for FM				

CU-A34BBP8, CU-A43BBP8, CU-A50BBP8


Control Box
Printed Circuit Board
LED 1 2 3 4 5 6 7 8
DSW1
SW3
SW2
SW1
CN2
CN4 (R)
CN7 (R)
CN6
CN8
CN10
CN1
CT. B
CT
T
Y B
BL R
SSR24
SSR21
SSR11
SSR12
SSR1
VA1 VA2 VA3 VA4 VA5 VA6 VA7 VA8
F
SA
Anti-Phase Protection Circuit
Tm
1 2 3 4
d.c. 2 - 5V
a.c. 220 - 240V
TM
L1 L2 L3 N
Y/G
Body
Power Source 380 - 415 V 3N~
To Indoor Unit
52C
A1 A2
31 32
R S T
U V W
CM (49C)
T1 T2 T3
63H2
63H1
Th2
Th1
20SV2
20SV1
CH
FM1 (49F1)
FM2 (49F2)
C1
C2
Cn (R)
Cn (W)
Cn (B)
Cn (BL)
Cn (Y)
R W BL B Y O V P GR BR G


☆Compressor Terminal
T1(R)
T2 (W)
T3 (BL)

WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

LEGEND

CM	Compressor Motor	$20SV_1$	Reversing Valve		Printed Circuit Board
$FM_{1,2}$	Fan Motor (Outdoor Unit)	$20SV_2$	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TM	Terminal Board for Main Circuit	$VA_{1\sim8}$	Varistor
$C_{1,2}$	Capacitor for FM_{12}	CT.B	Current Trans Board	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	Th_1	Thermistor (Compressor discharger temp.)	$CN_{1\sim10}$	Connector
$63H_1$	High Pressure Switch	Th_2	Thermistor (Heat exchanger outlet temp.)	$SSR_{12,11}$	Solid State Relay
$63H_2$	High Pressure Switch on Heat-pump	CT	Current Transformer	$SSR_{21,24}$	Solid State Relay
Cn	Connector	49C	Internal Protector for CM	Tm	Terminal Board for Control Circuit
T	Transformer	$49F_{1,2}$	Internal Protector for FM_{12}		

■APPLICABLE MODEL

ALL MODEL

●INDOOR UNIT

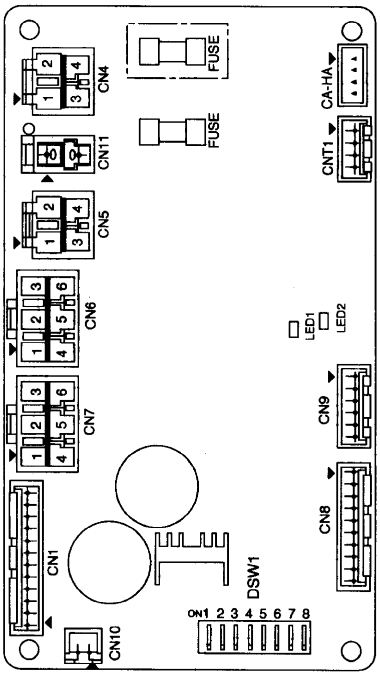
PRINTED CIRCUIT BOARD

S PHASE	4	CN4
SURGE ABSORBER	3	
————————	2	
R PHASE	1	

INDOOR FAN L	4	CN5
INDOOR FAN M	3	
INDOOR FAN H	2	
COM (S PH)	1	

TRANSFORMER 1ST (R PH)	6	CN7
TRANSFORMER 2ND	5	
TRANSFORMER 2ND	4	
TRANSFORMER 1ST (S PH)	3	
TRANSFORMER 2ND	2	
TRANSFORMER 2ND	1	

ROOM THERMISTOR	12	CN1
ROOM THERMISTOR	11	
PIPE THERMISTOR	10	
PIPE THERMISTOR	9	
————————	8	
————————	7	
	6	
	5	
COMMUNICATION WITH OUTDOOR UNIT	4	
COMMUNICATION WITH OUTDOOR UNIT	3	
WIRED REMOTE CONTROLLER	2	
WIRED REMOTE CONTROLLER	1	


CN4
1
2
3
4
FUSE
FUSE
CA-HA
CN11
CNT1
CN5
1
2
3
4
CN6
1
2
3
4
5
6
LED1
LED2
CN9
CN7
1
2
3
4
5
6
CN8
CN1
DSW1
ON1 2 3 4 5 6 7 8
CN10

CENTRAL CONTROL BOARD CONNECTION	CN8

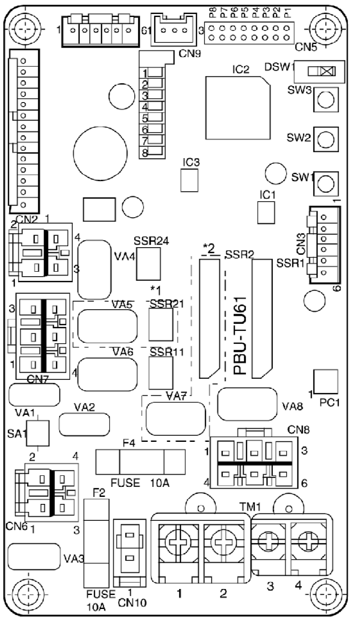
APPLICABLE FOR ALL MODELS

● OUTDOOR UNIT PRINTED CIRCUIT BOARD

	14	CN2
	13	
GND	12	
DEMAND INPUT	11	
GND	10	
HEATING PRESSURE SW	9	
GND	8	
HIGH PRESSURE SW	7	
GND	6	
PIPE TEMP SENSOR	5	
GND	4	
DISCHARGE TEMP SENSOR	3	
GND	2	
CT	1	

*1. HEAT PUMP MODEL ONLY
*2. CU-34BB type
CU-43BB type } Model only
CU-50BB type

COMMUNICATION WITH INDOOR UNIT	4	TM1
COMMUNICATION WITH INDOOR UNIT	3	
S Phase	2	
R Phase	1	



1
6
CN9
3
P8 P7 P6 P5 P4 P3 P2 P1
CN5
IC2
DSW1
SW3
SW2
SW1
1
2
3
4
5
6
7
8
IC3
IC1
CN2
2
1
4
3
VA4
SSR24
*2
SSR2
SSR1
CN3
1
6
*1
VA5
SSR21
VA6
SSR11
PBU-TU61
CN7
VA7
VA8
PC1
VA1
VA2
SA1
F4
CN8
FUSE 10A
F2
TM1
CN6
VA3
FUSE 10A
CN10
1
2
3
4

S Phase	1	CN8
Fan2(R)	2	
Fan1(R)	3	
S Phase	4	
S Phase	5	
S Phase	6	

TRANSFORMER 2ND(S)	4	CN4
TRANSFORMER 1ST(R)	3	
TRANSFORMER 2ND(R)	2	
TRANSFORMER 1ST(S)	1	

CRANKCASE HEATER(S)	1	CN10
CRANKCASE HEATER(R)	2	

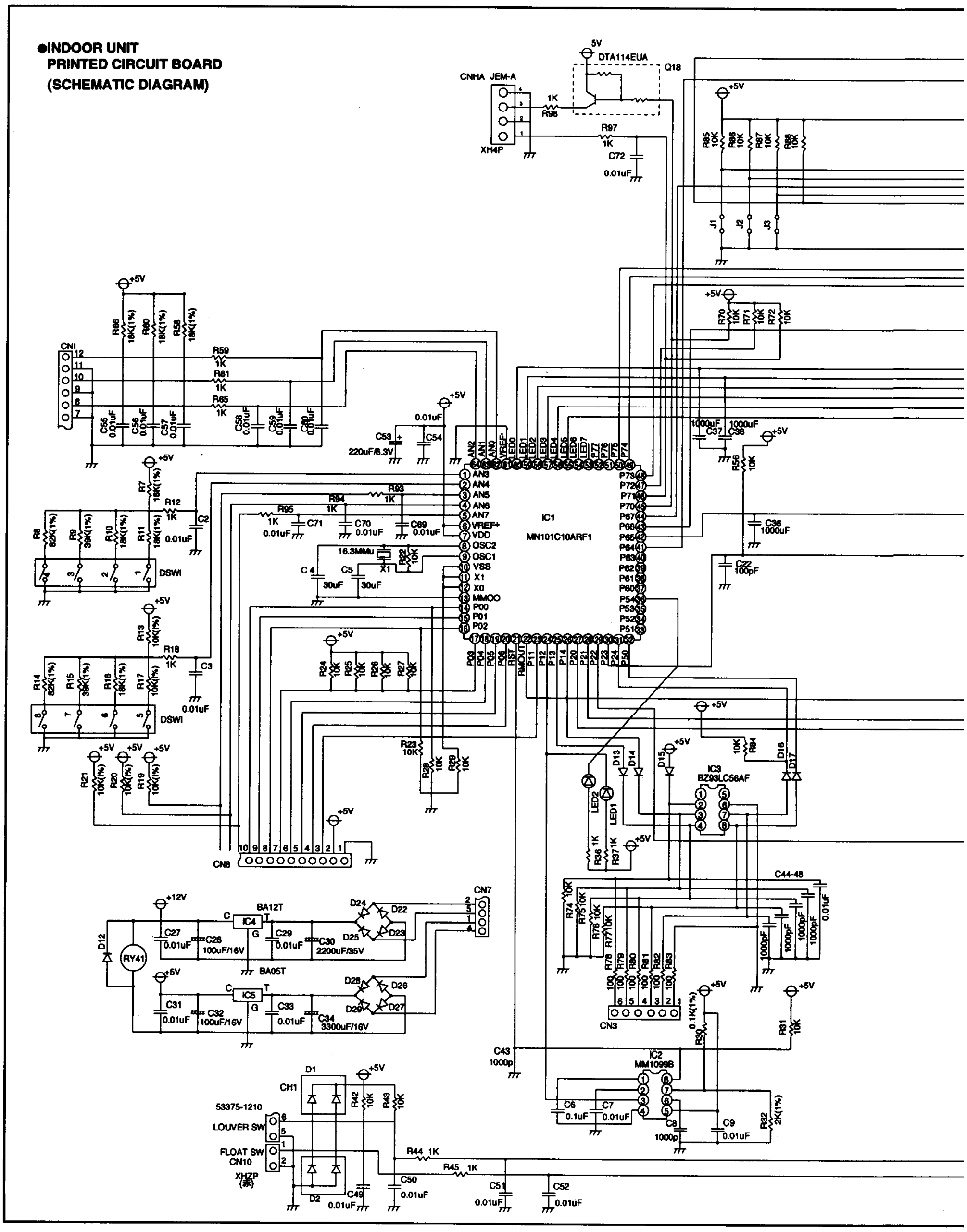
LIQUID BYPASS valve(R)	6	CN7
REVERSING valve(R)	5	
COMPRESSOR relay(R)	4	
LIQUID BYPASS valve(S)	3	
REVERSING valve(S)	2	
COMPRESSOR relay(S)	1	

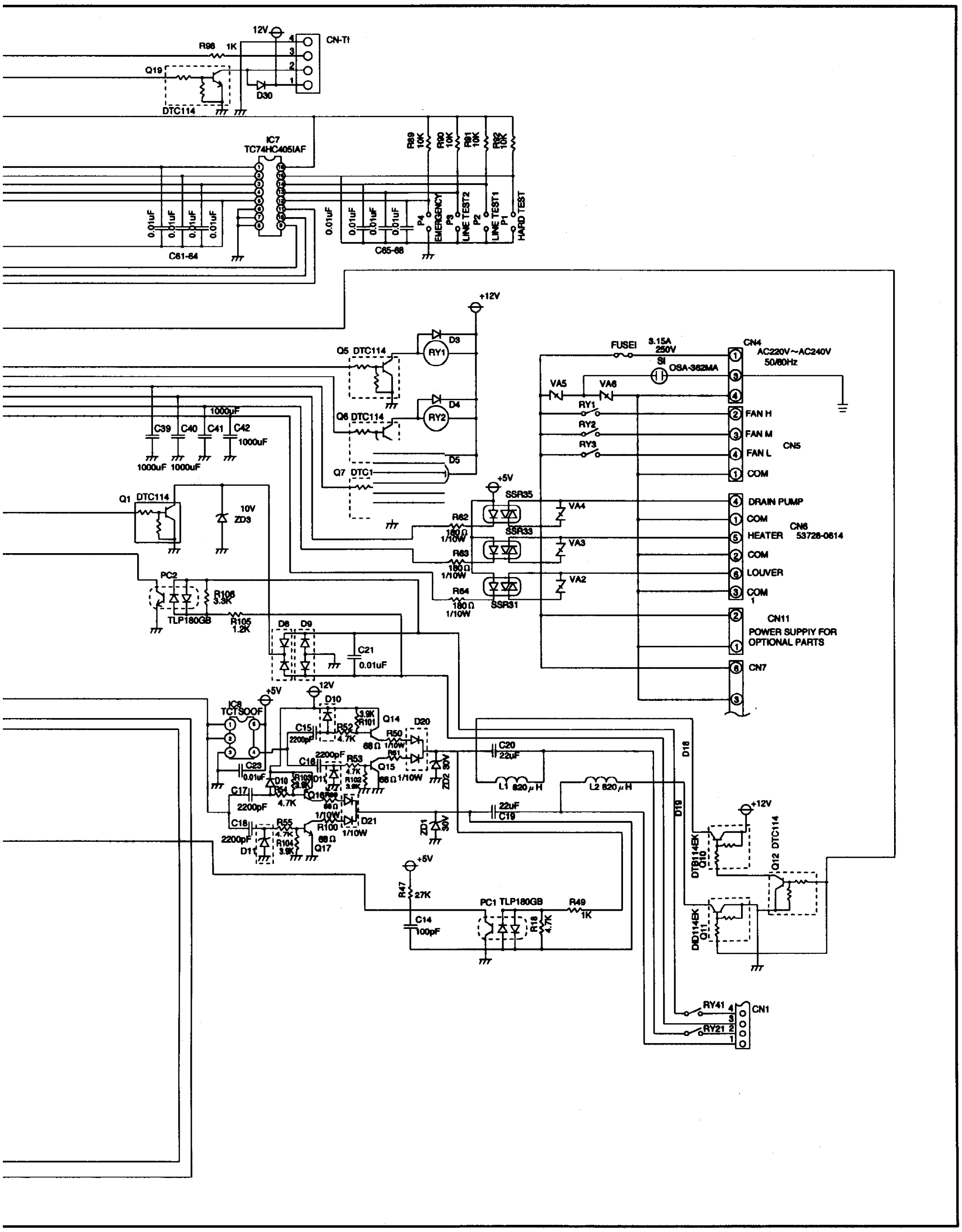
R Phase	4	CN6
S Phase	3	
Earth	2	
T Phase	1	

■APPLICABLE MODEL

ALL MODEL

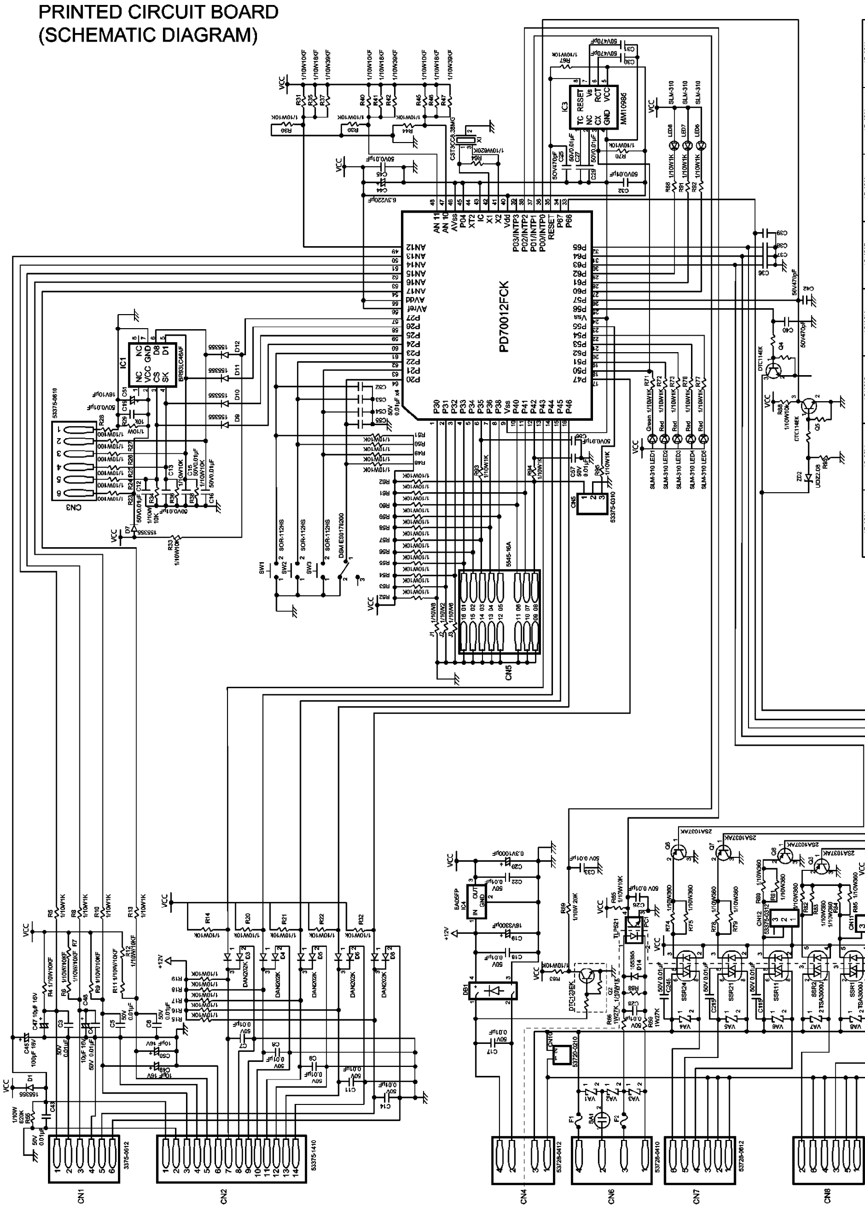
●INDOOR UNIT PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)


CNHA JEM-A
XH4P
R96 1K
R97 1K
C72 0.01uF
5V
DTA114EUA
Q18
+5V
R85 10K
R86 10K
R87 10K
R88 10K
J1
J2
J3
R70 10K
R71 10K
R72 10K
CNI
R66 18K(1%)
R60 18K(1%)
R58 18K(1%)
R59 1K
R61 1K
R65 1K
C55 0.01uF
C56 0.01uF
C57 0.01uF
C58 0.01uF
C59 0.01uF
C60 0.01uF
C53 220uF/6.3V
C54 0.01uF
C37 1000uF
C38 1000uF
R56 10K
C36 1000uF
C22 100pF
IC1
MN101C10ARF1
AN3
AN4
AN5
AN6
AN7
VREF+
VDD
OSC2
OSC1
VSS
X1
X0
MMOO
P00
P01
P02
AN2
AN1
AN0
VREF-
LED0
LED1
LED2
LED3
LED4
LED5
LED6
LED7
P77
P76
P75
P74
P73
P72
P71
P70
P67
P66
P65
P64
P63
P62
P61
P60
P54
P53
P52
P51
P03
P04
P05
P06
RST
RMOUT
P11
P12
P13
P14
P20
P21
P22
P23
P24
P50
R93 1K
R94 1K
R95 1K
C71 0.01uF
C70 0.01uF
C69 0.01uF
16.3MMu
X1
R22 10K
C4 30uF
C5 30uF
R7 18K(1%)
R12 1K
C2 0.01uF
R8 82K(1%)
R9 39K(1%)
R10 18K(1%)
R11 18K(1%)
DSWI
R13 10K(1%)
R18 1K
C3 0.01uF
R14 82K(1%)
R15 39K(1%)
R16 18K(1%)
R17 10K(1%)
DSWI
R21 10K(1%)
R20 10K(1%)
R19 10K(1%)
R24 10K
R25 10K
R26 10K
R27 10K
R23 10K
R28 10K
R29 10K
CN8
D13
D14
D15
D16
D17
LED2
LED1
R36 1K
R37 1K
R34 10K
IC3
BZ93LC56AF
C44-48
R74 10K
R75 10K
R77 10K
R78 100
R79 100
R80 100
R81 100
R82 100
R83 100
1000pF
0.01uF
CN3
R30 0.1K(1%)
R31 10K
+12V
D12
RY41
IC4
BA12T
C27 0.01uF
C28 100uF/16V
C29 0.01uF
C30 2200uF/35V
D22
D23
D24
D25
CN7
IC5
BA05T
C31 0.01uF
C32 100uF/16V
C33 0.01uF
C34 3300uF/16V
D26
D27
D28
D29
C43 1000p
IC2
MM1099B
C6 0.1uF
C7 0.01uF
C8 1000p
C9 0.01uF
R32 2K(1%)
D1
D2
CH1
53375-1210
LOUVER SW
FLOAT SW
CN10
XH2P
R42 10K
R43 10K
C49 0.01uF
C50 0.01uF
R44 1K
R45 1K
C51 0.01uF
C52 0.01uF


12V
CN-TI
R98 1K
Q19
D30
DTC114
IC7
TC74HC4051AF
R89 10K
R90 10K
R91 10K
R92 10K
0.01uF
C61-64
C65-68
P4
EMERGENCY
P3
LINE TEST2
P2
LINE TEST1
P1
HARD TEST
+12V
D3
RY1
Q5 DTC114
D4
RY2
Q6 DTC114
D5
Q7 DTC1
1000uF
C39
C40
C41
C42
Q1 DTC114
10V
ZD3
PC2
TLP180GB
R106 3.3K
R105 1.2K
+5V
SSR35
R62 180Ω 1/10W
SSR33
R63 180Ω 1/10W
SSR31
R64 180Ω 1/10W
VA4
VA3
VA2
FUSEI
3.15A 250V
SI
OSA-362MA
CN4
AC220V~AC240V 50/60Hz
VA5
VA6
RY1
RY2
RY3
FAN H
FAN M
FAN L
COM
CN5
DRAIN PUMP
COM
HEATER
CN6 53728-0614
COM
LOUVER
COM 1
CN11
POWER SUPPIY FOR OPTIONAL PARTS
CN7
D8
D9
C21 0.01uF
IC8 TCTSOOF
C23 0.01uF
D10
C15 2200pF
R52 4.7K
3.9K R101
Q14
D20
R50 68Ω 1/10W
R51
C16 2200pF
R53 4.7K
R102 3.9K
Q15
68Ω 1/10W
D11
R103 3.9K
R54 4.7K
Q16
R99 68Ω 1/10W
C17 2200pF
C18 2200pF
R55 4.7K
R104 3.9K
R100 68Ω 1/10W
Q17
D21
ZD2 30V
ZD1 30V
C20 22uF
L1 820μH
L2 820μH
22uF C19
D18
D19
+5V
R47 27K
C14 100pF
PC1 TLP180GB
R18 4.7K
R49 1K
+12V
DTB114EK Q10
Q12 DTC114
DTD114EK Q11
RY41
RY21
CN1

APPLICABLE FOR ALL MODELS

● OUTDOOR UNIT PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)

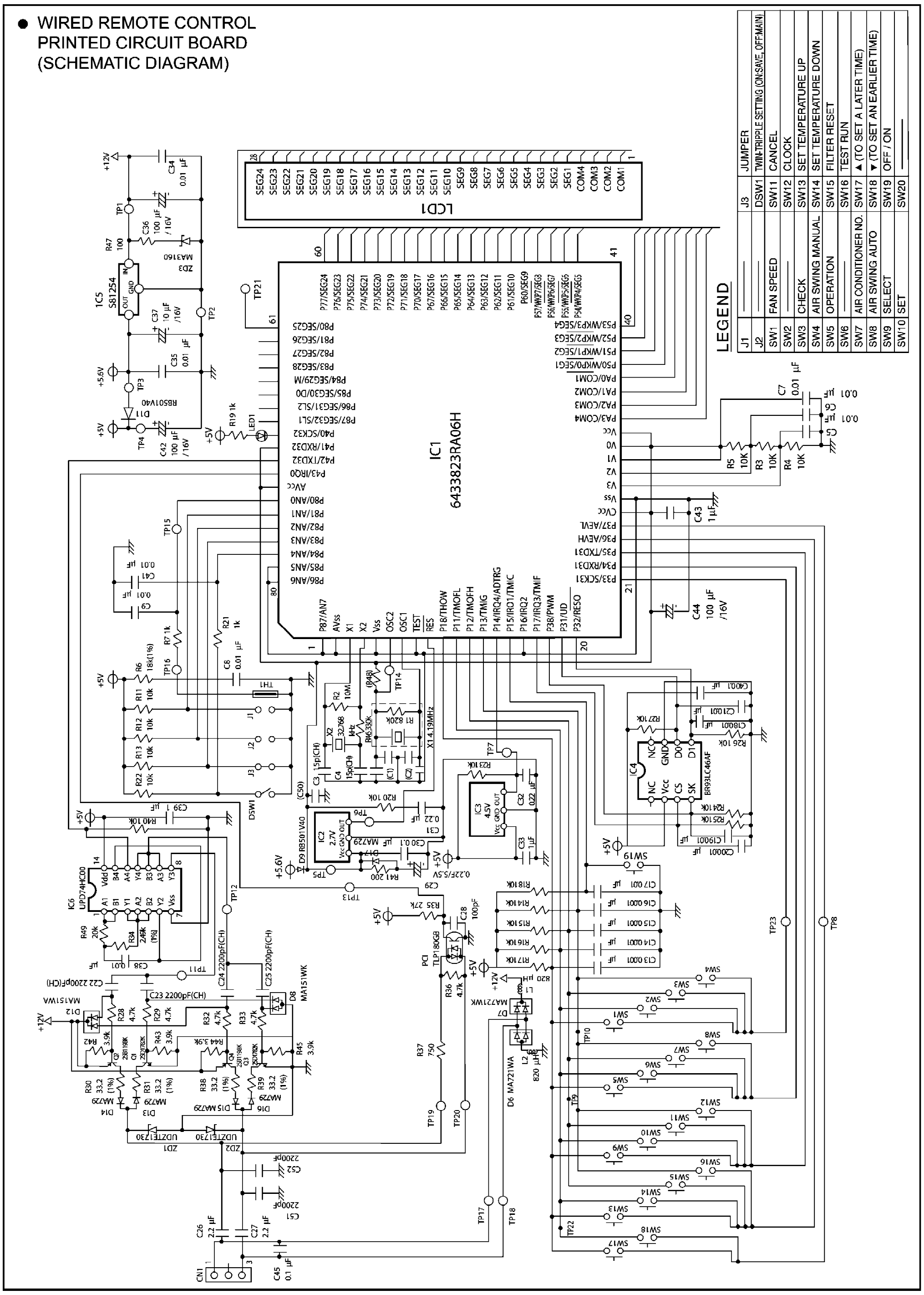

PD70012FCK
IC1
IC3
MM1096
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
TM1
VCC
SW1
SW2
SW3
SSR1
SSR2
SSR11
SSR21
SSR24
DB1
AC230V

	A742583	A742584	A742585	A742586	A742587	A742588	A742589	A742590
D14	NONE	AVLB	←	←	NONE	AVLB	NONE	←
C26	NONE	AVLB	←	←	NONE	AVLB	NONE	←
C28	NONE	AVLB	←	←	NONE	AVLB	NONE	←
R66	NONE	AVLB	←	←	NONE	AVLB	NONE	←
R68	NONE	AVLB	←	←	NONE	AVLB	NONE	←
R69	NONE	AVLB	←	←	NONE	AVLB	NONE	←
J1	NONE	←	←	AVLB	←	←	←	NONE
J2	AVLB	NONE	←	←	AVLB	NONE	AVLB	←
PC1	NONE	AVLB	←	←	NONE	AVLB	NONE	←
SSR2	NONE	←	AVLB	←	NONE	←	AVLB	←
VA3	NONE	AVLB	←	←	NONE	AVLB	NONE	←
VA5	AVLB	←	←	NONE	←	←	←	AVLB
VA7	NONE	←	AVLB	←	NONE	←	AVLB	←
SSR21	AVLB	←	←	NONE	←	←	←	AVLB

AVLB : Available
NONE : Not available

APPLICABLE FOR ALL MODELS

- WIRED REMOTE CONTROL
  PRINTED CIRCUIT BOARD
  (SCHEMATIC DIAGRAM)


IC1
6433823RA06H
LCD1
IC5 S81254
IC6 UPD74HC00
IC4 BR93LC46AF
IC2
IC3
PC1 TLP180GB
CN1

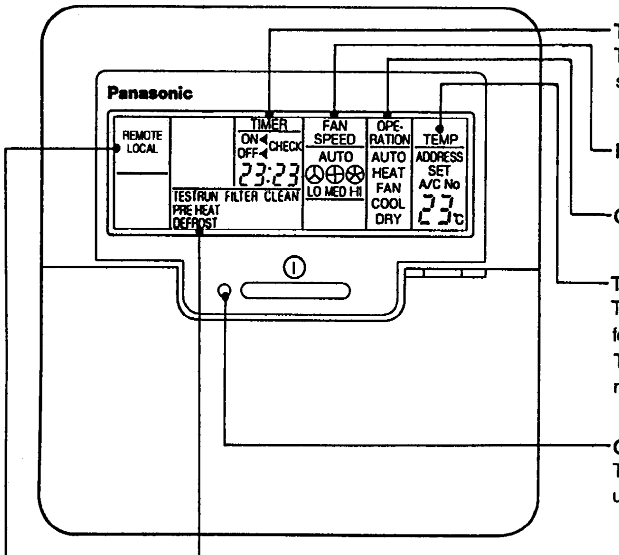
LEGEND

J1	———	J3	JUMPER
J2	———	DSW1	TWIN-TRIPPLE SETTING (ON:SAVE, OFF:MAIN)
SW1	FAN SPEED	SW11	CANCEL
SW2	———	SW12	CLOCK
SW3	CHECK	SW13	SET TEMPERATURE UP
SW4	AIR SWING MANUAL	SW14	SET TEMPERATURE DOWN
SW5	OPERATION	SW15	FILTER RESET
SW6	———	SW16	TEST RUN
SW7	AIR CONDITIONER NO.	SW17	▲ (TO SET A LATER TIME)
SW8	AIR SWING AUTO	SW18	▼ (TO SET AN EARLIER TIME)
SW9	SELECT	SW19	OFF / ON
SW10	SET	SW20	———

6. OPERATING INSTRUCTION

6.1. Wired Remote Control

Name and function of each part


Panasonic
REMOTE
LOCAL
TIMER
ON
OFF
CHECK
23:23
TESTRUN FILTER CLEAN
PRE HEAT
DEFROST
FAN SPEED
AUTO
LO MED HI
OPE-RATION
AUTO
HEAT
FAN
COOL
DRY
TEMP
ADDRESS
SET
A/C No
23°C

Timer/time setting display
This display shows the timer operation setting time or the current time.

Fan speed display

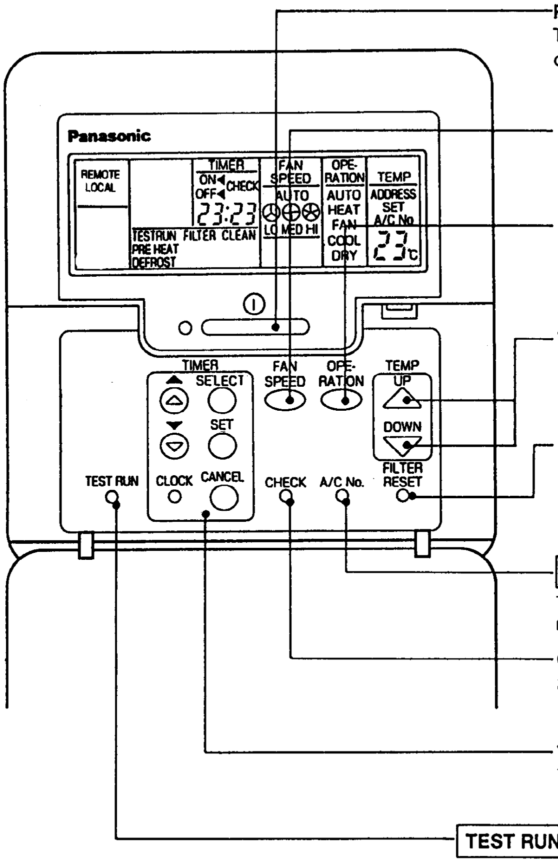
Operation selection display

Temperature setting display
This display shows the setting temperature for the indoor unit.
The temperature can be set within the range 16° - 31°C.

Operation indicator (red)
This indicator illuminates when the indoor unit is running.

TEST
Indicates that the indoor unit is running in test operation mode.
PREHEAT DEFROST
Indicates that the indoor unit is running in pre-heating or defrosting mode.
CLEAN FILTER
Indicates that it is time to clean the filter.
It appears after the cumulative running time reaches approximately 200 hours.

REMOTE
The RUN and STOP functions on the remote control unit cannot be used.
LOCAL
All remote control unit functions can be used.
COMMON
Operation is possible using a device other than the remote control unit.


Panasonic
REMOTE
LOCAL
TIMER
ON
OFF
CHECK
23:23
TESTRUN
FILTER CLEAN
PRE HEAT
DEFROST
FAN SPEED
AUTO
LO MED HI
OPE-RATION
AUTO
HEAT
FAN
COOL
DRY
TEMP
ADDRESS
SET
A/C No
23℃
TIMER
SELECT
SET
FAN SPEED
OPE-RATION
TEMP
UP
DOWN
TEST RUN
CLOCK
CANCEL
CHECK
A/C No.
FILTER RESET

RUN switch
This switch is used to run or stop the indoor unit operation.

FAN SPEED switch

OPERATION MODE switch

TEMPERATURE SETTING switch

FILTER RESET switch
After the filter has been cleaned, press this switch to clear the "CLEAN FILTER" display.

Air conditioner No. switch
This switch is used during group control. It is not needed for normal operation.

CHECK switch
Press this switch if the check display is flashing.

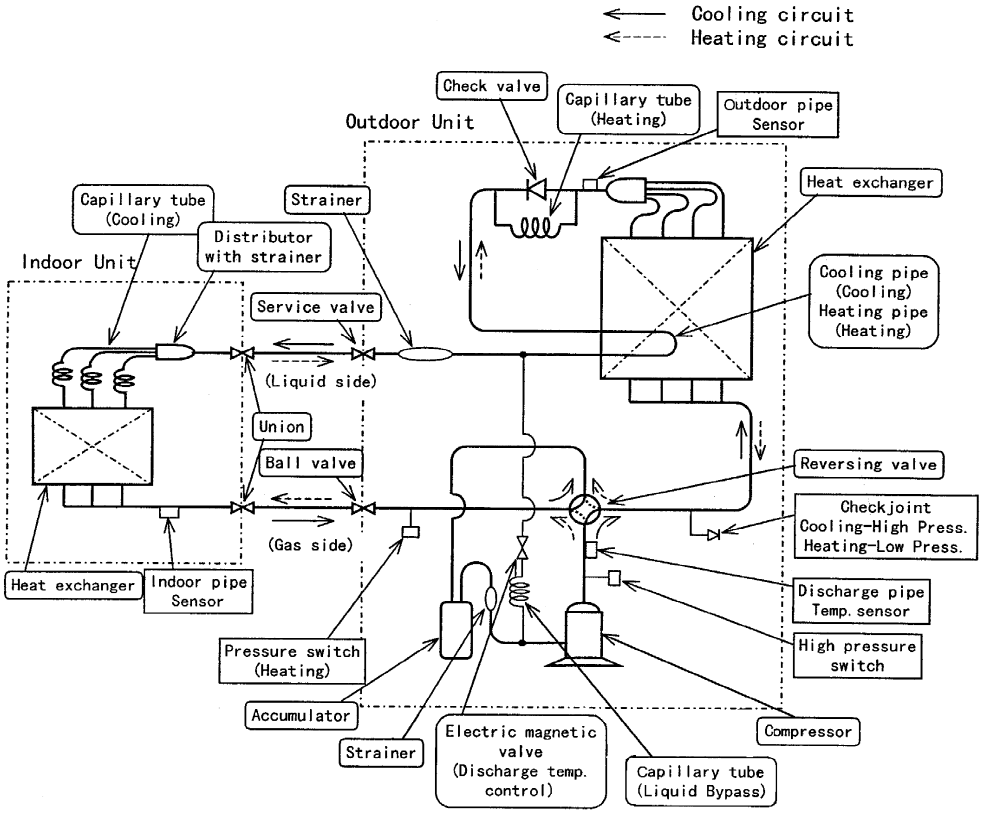
TIMER SET switch
This switch is used to set the timer operation and to set the current time.

TEST RUN switch
This switch is only used during test operation. It is not needed for normal operation.

7. REFRIGERATION CYCLE

7.1. Heating Model

CS-A24BD1P / CU-A24BBP5 / CS-A28BD1P / CU-A28BBP5, 8 / CS-A34BD1P / CU-A34BBP5, 8 / CS-A43BD1P / CU-A43BBP8 / CS-A50BD1P / CU-A50BBP8


Cooling circuit
Heating circuit
Check valve
Capillary tube (Heating)
Outdoor pipe Sensor
Outdoor Unit
Heat exchanger
Capillary tube (Cooling)
Strainer
Distributor with strainer
Indoor Unit
Cooling pipe (Cooling) Heating pipe (Heating)
Service valve
(Liquid side)
Union
Ball valve
Reversing valve
Checkjoint Cooling-High Press. Heating-Low Press.
(Gas side)
Heat exchanger
Indoor pipe Sensor
Discharge pipe Temp. sensor
High pressure switch
Pressure switch (Heating)
Accumulator
Compressor
Strainer
Electric magnetic valve (Discharge temp. control)
Capillary tube (Liquid Bypass)

/ / / / / / / / / / / / / /

8. OPERATION RANGE

Power Supply / The applicable voltage range for each unit is given in “ the following table”. The working voltage among the three phases must be balanced within 3% deviation from each voltage at the compressor terminals. The starting voltage must be higher than 85% of the rated voltage. / / / Power Supply

Model-CU	Unit Main Power		Applicable Voltage		Model-CU	Unit Main Power		Applicabl	
	Phase, Volts	Hz	Maximum	Minimum		Phase, Volts	Hz	Maximum	
A24BBP5	1~220	50	242	198	A28BBP8	3N~380	50	418	
A28BBP5	1~230	50	253	207	A34BBP8	3N~400	50	440	
A34BBP5	1~240	50	254	216	A43BBP8	3N~415	50	457	
					A50BBP8				

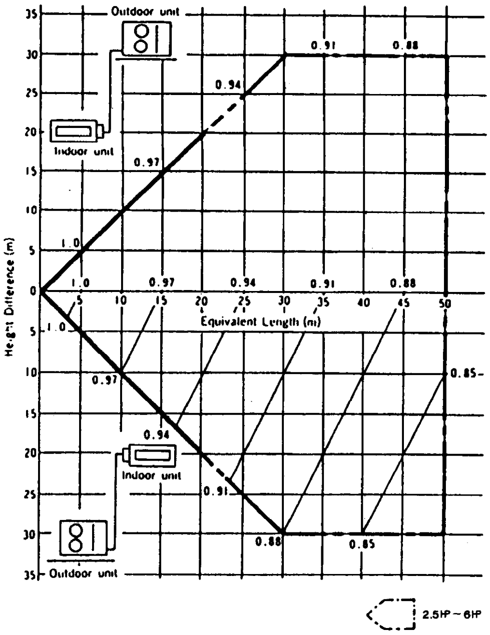
Indoor and Outdoor Temperature All Models

Operating	Hz	Indoor Temp. (D.B./W.B.) (°C)		Outdoor Temp. (D.B./W	
		Maximum	Minimum	Maximum	Mi
Cooling	50	32/23	21/15	43/-	
Heating	50	27/-	16/-	24/18	-

9. PIPE LENGTH

9.1. CORRECTION OF COOLING AND HEATING CAPACITIES

Correction of cooling and heating capacities according to the connecting pipe length. / The data of cooling capacities (marked on the name plate) are based on 5 metres connecting pipe and horizontal installation. / (Cooling)

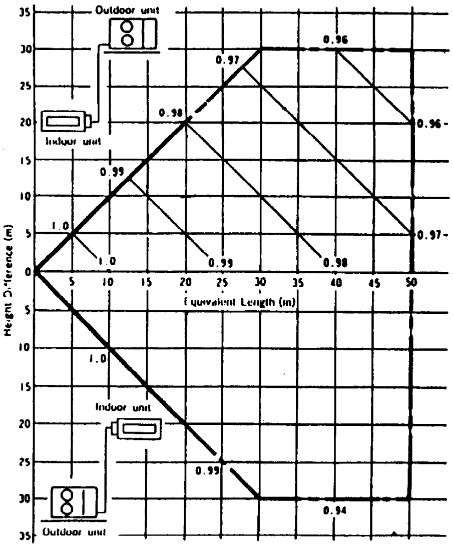


/ / / Equivalent Length = actual pipe length + / number of elbow x ELE + number of oil / trap x ELO / ELE : equivalent length of elbow. / ELO : equivalent length of oil trap.

9.2. REFRIGERANT ADDITIONAL CHARGE

- **The piping length exceeds 30 metres. / APPLICABLE FOR ALL MODELS**
  Before shipment, this air conditioner is filled with the rated amount of refrigerant subject to 30m piping length. (The rated amount of refrigerant is indicated on the name plate.) But when the piping length exceeds 30m, additional charge is required according to the following table.

For other pipe length of other installation multiply / by the following correction factor to determine the revised cooling capacity. / / (Heating)



Outer diameter of gas side pipe mm (inch)	ELE
9.52	0.18
12.7 (1/2)	0.20
15.88 (5/8)	0.25
19.05 (3/4)	0.35

Model	Ref. Charge
2.5HP	20g per 1m
3~6HP	50g per 1m

Example : / CS-A24BD1P / In case of 30 m long pipe (one-way), the / amount of refrigerant to be replenished is: / (30 - 30) x 20 = 0g / CS-A43BD1P / In case of 50m long pipe (one-way), the / amount of refrigerant to be replenished is: / (50 - 30) x 50 = 1,000g

9.3. Piping installation by existing piping

It is possible to use the existing piping by adjusting the refrigerant gas volume. / Please do correct piping installation referring to the table below.

Heat pump type	Standard piping specification					Existing piping specification (Larger pi			
	Liquid piping	Gas piping	Gas charge -less length	Additional gas volume		Liquid piping	Gas piping	Gas charge-less length	Additi gas vo
	(Ømm)	(Ømm)	(mm)	(g/m)		(Ømm)	(Ømm)	(m)	(g/
CU-A24BBP5	6.35	15.88	30	20		9.52	15.88	13	50
CU-A28BBP5,8	9.52	15.88	30	50		12.7	15.88	17	10
CU-A34BBP5,8	9.52	19.05	30	50		12.7	19.05	17	10
CU-A43BBP8	9.52	19.05	30	50		12.7	19.05	17	10
CU-A50BBP8	9.52	19.05	30	50		12.7	19.05	17	10

Attention

- **Please never decrease the gas piping size. (It causes the breakdown of the compressor)**
- **The equivalent piping length and the cooling and heating capacity change rate are same as the standard piping / specification.**

10. OPERATING CHARACTERISTIC

10.1. OPERATING CHARACTERISTIC

HEAT PUMP MODEL

Model	Main Power Source		Compressor Motor			Indoor Unit Fan Motor		Outdoor Fan Mo	
	Voltage (V)	Frequency (Hz)	S.C. (A)	R.C.(A) COOL/ HEAT	IPT(kW) COOL/ HEAT	R.C. (A)	IPT (kW)	R.C. (A)	
CS-A24BD1P	220	50	49	10.6 / 10.5	2.31 / 2.30	0.92	0.20	0.50	
CU-A24BBP5	230	50	51	10.2 / 10.1	2.31 / 2.30	0.92	0.20	0.50	
	240	50	52	9.8 / 9.8	2.31 / 2.30	0.92	0.20	0.50	
CS-A28BD3P	220	50	50	11.35 / 11.05	2.49 / 2.41	0.92	0.20	0.50	
CU-A28BBP5	230	50	52	11.05 / 10.75	2.49 / 2.41	0.92	0.20	0.50	
	240	50	54	10.75 / 10.45	2.49 / 2.41	0.92	0.20	0.50	
CS-A28BD1P	380	50	28	4.18 / 3.98	2.49 / 2.41	0.92	0.20	0.50	
CU-A28BBP8	400	50	29	4.13 / 3.93	2.49 / 2.41	0.92	0.20	0.50	
	415	50	30	4.08 / 3.88	2.49 / 2.41	0.92	0.20	0.50	
CS-A34BD1P	220	50	94	15.3 / 15.1	3.23 / 3.18	1.79	0.40	1.00	
CU-A34BBP5	230	50	99	15.4 / 15.2	3.23 / 3.18	1.79	0.40	1.00	
	240	50	103	15.5 / 15.3	3.23 / 3.18	1.79	0.40	1.00	
CS-A34BD1P	380	50	39	5.13 / 5.23	2.93 / 3.03	1.79	0.40	1.00	
CU-A34BBP8	400	50	41	5.13 / 5.23	2.93 / 3.03	1.79	0.40	1.00	
	415	50	42	5.13 / 5.23	2.93 / 3.03	1.79	0.40	1.00	
CS-A43BD1P	380	50	58	6.63 / 6.33	3.82 / 3.67	2.47	0.55	1.10	
CU-A43BBP8	400	50	58	6.63 / 6.33	3.82 / 3.67	2.47	0.55	1.10	
	415	50	58	6.63 / 6.33	3.82 / 3.67	2.47	0.55	1.10	
CS-A50BD1P	380	50	69	7.90 / 7.80	4.54 / 4.52	3.23	0.71	1.20	
CU-A50BBP8	400	50	69	7.90 / 7.80	4.56 / 4.54	3.23	0.71	1.20	
	415	50	69	7.90 / 7.80	4.54 / 4.52	3.23	0.71	1.20	

Legend : S.C. : Starting Current / R.C. : Running Current / IPT : Power Consumption

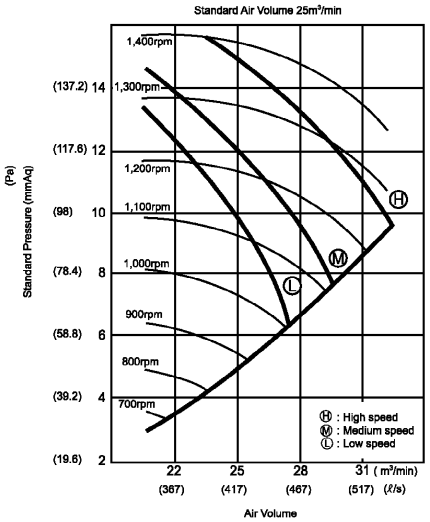
11. FAN PERFORMANCE

Fan Performance

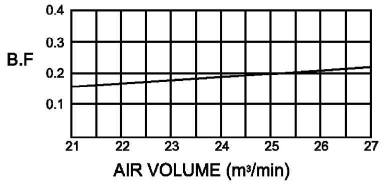
Model CS-	Power Frequency (Hz)	Air Volume			External Static Pressure in mmAq						
					0 (0)	2.5 (24.5)	5 (49)	7.5 (73.5)	10 (98)	12.5 (123)	(
		cfm	m3/min	l/S	rpm						
A24BD1P	50	77	22	367	735	885	1030	1180	1300		
		883	25	417	875	1005	1135	1250	1375		
		988	28	467	1035	1145	1255				
		1094	31	517	1180	1280					
A28BD1P	50	953	27	450	750	920	1075	1210	1325		
		1059	30	500	890	1030	1170	1290	1390		
		1165	33	550	1040	1155	1275	1275			
		1271	36	600	1180	1290					
A34BD1P	50	1200	34	567	770	860	950	1040	1110	1190	1
		1341	38	633	870	940	1000	1080	1150	1230	
		1487	42	700	950	1025	1090	1150	1225		
		1624	46	767	1000	1060	1130				
A43BD1P	50	1487	42	700	905	985	1060	1135	1205	1270	1
		1624	46	767	990	1060	1130	1200	1265	1335	
		1765	50	833	1080	1145	1210	1270	1335		
		1906	54	900	1165	1230	1290				
A50BD1P	50	1942	55	917	1035	1095	1165	1230	1285	1345	1
		2083	59	983	1125	1170	1230	1295	1355	1410	
		2224	63	1050	1205	1255	1310	1365	1420		
		2365	67	1117	1290	1340	1395				

● CS-A24BD1P

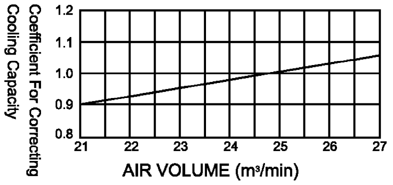
Fan Performance Curve



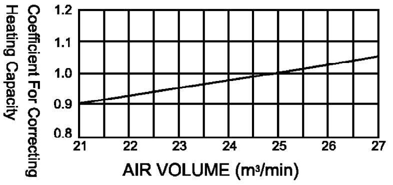
Bypass factor and Coefficient For Correcting Capacity according to Air volume change Bypass factor. (B.F)



Coefficient For Correcting Cooling Capacity

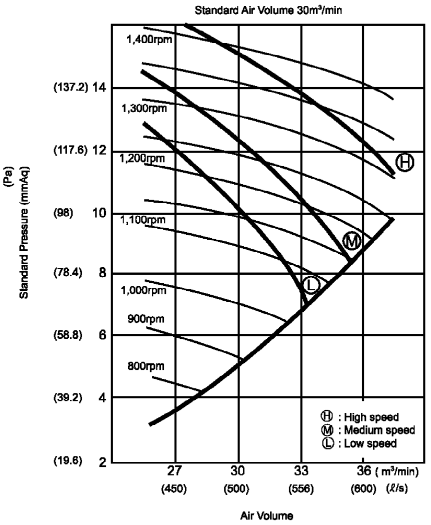


Coefficient For Correcting Heating Capacity

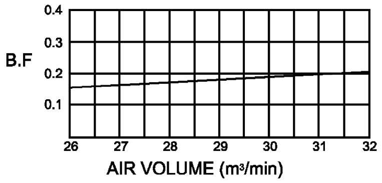


● CS-A28BD1P

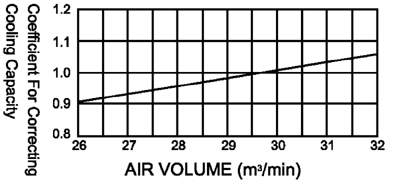
Fan Performance Curve



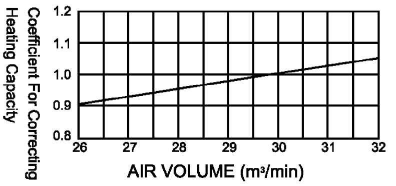
Bypass factor and Coefficient For Correcting Capacity according to Air volume change Bypass factor. (B.F)



Coefficient For Correcting Cooling Capacity

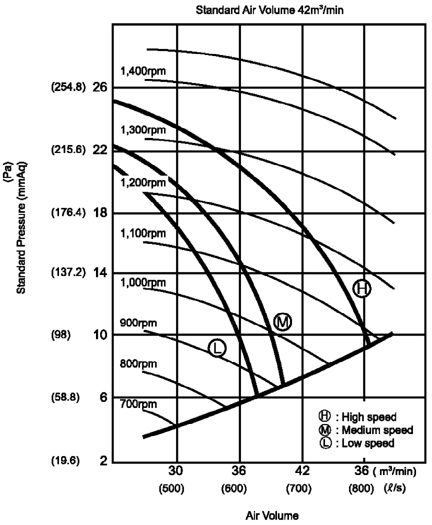


Coefficient For Correcting Heating Capacity

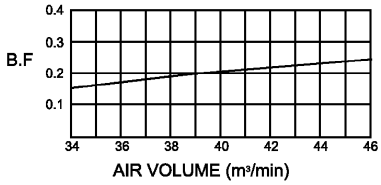


● CS-A34BD1P

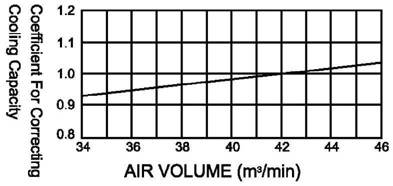
Fan Performance Curve



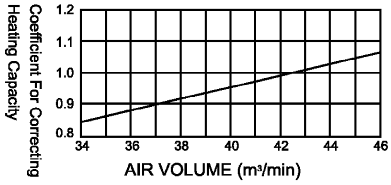
Bypass factor and Coefficient For Correcting Capacity according to Air volume change Bypass factor. (B.F)



Coefficient For Correcting Cooling Capacity

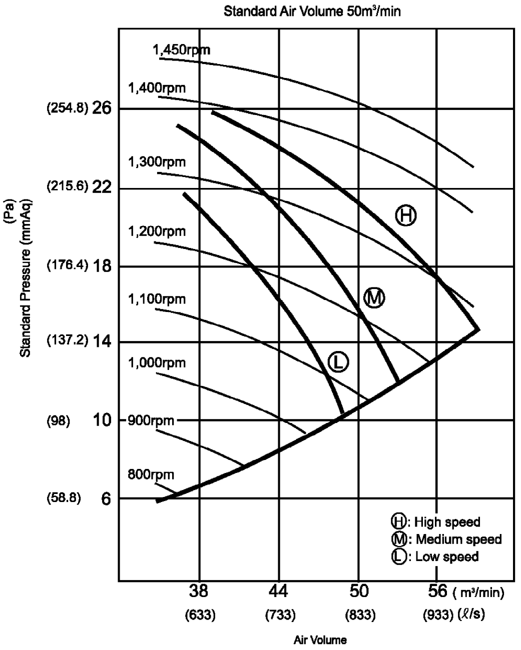


Coefficient For Correcting Heating Capacity

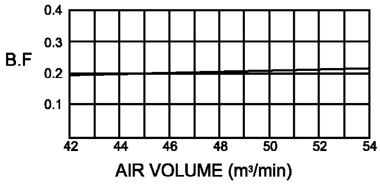


● CS-A43BD1P

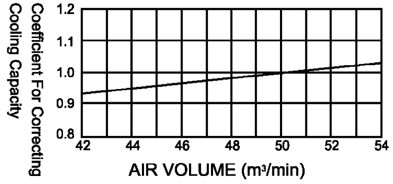
Fan Performance Curve



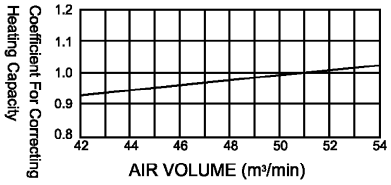
Bypass factor and Coefficient For Correcting Capacity according to Air volume change Bypass factor. (B.F)



Coefficient For Correcting Cooling Capacity

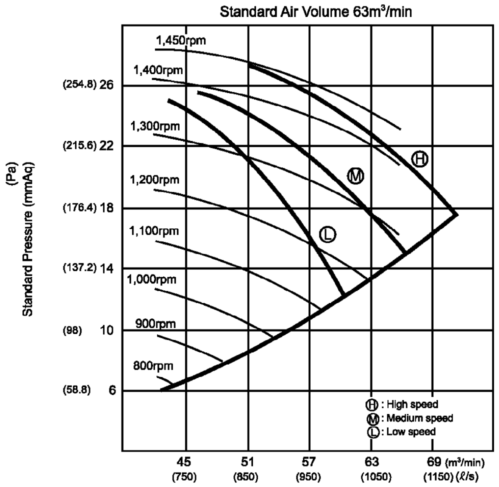


Coefficient For Correcting Heating Capacity



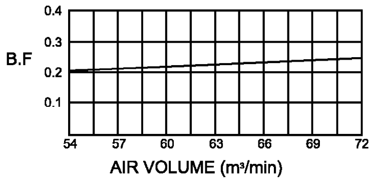
- CS-A50BD1P

Fan Performance Curve

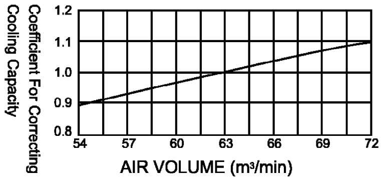


Bypass factor and Coefficient For Correcting Capacity according to Air volume change

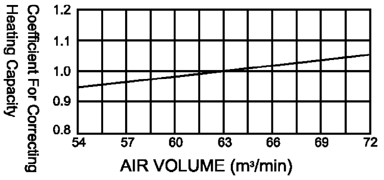
Bypass factor. (B.F)



Coefficient For Correcting Cooling Capacity



Coefficient For Correcting Heating Capacity



12. SAFETY DEVICE

● INDOOR UNIT

Indoor unit		Model	CS-A24BD1P	CS-A28BD1P	CS-A28BD1P	CS-A34BD1P	CS-A34BD1P	CS-A43BD1P
For fan motor protection								
Internal protector (49F)	OFF	°C	135	135	135	135	135	135
	ON	°C	87	87	87	87	87	87
For control protection								
Fuse	CUT	A	3	3	3	3	3	3

● OUTDOOR UNIT

Outdoor unit	Heat pump model	50Hz	CU-A24BBP5	CU-A28BBP5	CU-A28BBP8	CU-A34BBP5	CU-A34BBP8	CU-A43BBP8	A
For refrigerant cycle									
High pressure switch (63H1)	OFF	MPa	2.94	2.94	2.94	2.94	2.94	2.94	
	ON	MPa	2.84	2.84	2.84	2.84	2.84	2.84	
For compressor Over current protection									
Heat pump model	OFF	A	19	20	9	28	10	11	
	RESET	-	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic	A
Discharge temp protection									
Discharge temperature thermistor (Th1)	Compressor OFF	°C	115	115	115	120	120	120	
Liquid compress protection									
Crankcase heater	Input power	W	31-37	31-37	31-37	31-37	31-37	34-41	
Compressor protection									
Internal protector	OFF	°C 50Hz	160	165	120(*)	115	135	120	
	ON	°C 50Hz	90	102	90(*)	61	61	61	
	Trip time	50Hz	5-15sec/ 55A	5-15sec/ 55A	-	10sec/44A	10sec/40A	10sec/ 40A	1
For fan motor protection									
Internal protector (49F)	OFF	°C 50Hz	135	135	135	135	135	135	
	ON	°C 50Hz	85	85	85	85	85	85	
Heating control (Heat pump only)									
Pressure switch (Fan speed)(63H2)	OFF	MPa	2.35	2.35	2.35	2.35	2.35	2.35	
	ON	MPa	2.25	2.25	2.25	2.25	2.25	2.25	

Outdoor unit	Heat pump model	50Hz	CU-A24BBP5	CU-A28BBP5	CU-A28BBP8	CU-A34BBP5	CU-A34BBP8	CU-A43BBP8	
Cooling control									
Heat exchanger outlet temperature thermistor (Th2)	**Control method**		**Th greater or equal to 30°C ---------- High speed** **Th less than 30°C ---------- 5 speed step control**						
For control protection									
Fuse	CUT	A	6.3	6.3	6.3	6.3	6.3	6.3	

(*) 1MPa = 10.2kgf/cm^2

(*) Head Thermostat

13. COMPONENT SPECIFICATION

Compressor

Model	Heat pump model	50Hz	CU-A24BBP5	CU-A28BBP5 CU-A28BBP8	CU-A34BBP5 CU-A34BBP8	CU-A43BBP8	C A50
Compressor Model			NE41VNDT	NE44VNDT NE44VADT	ZR45KC-TFD ZR45KC-TF5	ZR57KC-TFD ZR57KC-TF5	ZR-6 TF ZR-6 TF
Compressor Type No. of Cylinders			ROTARY		SCROLL		
			1	1	1	1	1
Revolution		r/min	2,900	2,900	2,900	2,900	2,
Piston Displacement		m^3/h	7.27	7.73	10.73	13.42	16.
	Motor Type						
	Starting Method		Direct on-line Starting				
	Rated Output	kW	1.9	2.0	2.8	3.5	4.
	Poles		2	2	2	2	2
	Insulation Class		E	E	E	E	E
Oil Type			MS32	MS32	Sontex200LT	Sontex200LT	Sontex
	Charge	L	1.3	1.3	1.2	2.1	1.

Condenser

Models	Heat pump model		CU-A24BBP5	CU-A28BBP5 CU-A28BBP8	CU-A34BBP5 CU-A34BBP8	CU-A43BBP8	CU-A50BBP
	Tube Material		Copper tube				
	Outer Diameter	mm	9.52	9.52	9.52	9.52	9.52
	Thickness	mm	0.3	0.3	0.3	0.3	0.3
	Row		2	2	2	2	2
	No. of Tubes/ Row		34	34	46	46	46
	Fin Material		Aluminium				
	Thickness	mm	0.105	0.105	0.105	0.105	0.105
	Fin Pitch	No./ inch	14	14	14	14	14
	Fin Surface		AX-Louvre fin	AX-Louvre fin	AX-Louvre fin	AX-Louvre fin	AX-Louvre fin
	Total Face Area	m2	0.61	0.61	0.82	1.05	1.05
Fan							
	Type		Propeller Fan				
	No.of unit		1	1	2	2	2
Fan Motor							
	Starting Method		Direct on-line Starting				
	Rated Output	kW	0.05	0.05	0.05 X 2	0.05 X 2	0.055 X 2
	Poles		6	6	6	6	6
	Phase		Single-Phase	Single-Phase	Single-Phase	Single-Phase	Single-Phas
	Insulation Class		E	E	E	E	E

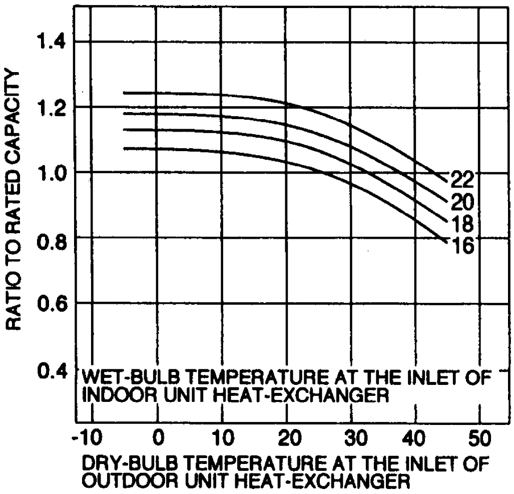
Evaporator

Models		CS-A24BD1P	CS-A28BD1P	CS-A34BD1P	CS-A43BD1P	CS-A
Tube Material		Copper Tube				
Outer Diameter	mm	9.53	9.53	9.53	9.53	
Thickness	mm	0.28	0.28	0.3	0.28	
Row		3	3	2	3	
No. of Tubes/ Row		24	30	32	40	
Fin Material		Aluminium				
Thickness	mm	0.11	0.11	0.11	0.11	
Fin Pitch	No./ inch	12	12	12	12	
Fin Surface		Louvre-fin	Louvre-fin	Louvre-fin	Louvre-fin	Lou
Total Face Area	G	0.218	0.218	0.360	0.360	0
Evaporator Fan		Sirocco Fan				
Type						
No./Unit		2	2	2	2	
Evaporator Fan motor		Direct On-Line Starting				
Starting						
Rated Output	kW	0.15	0.15	0.25	0.35	
Poles		4	4	4	4	
Phase		Single-Phase	Single-Phase	Single-Phase	Single-Phase	Singl
Insulation		E	E	E	E	

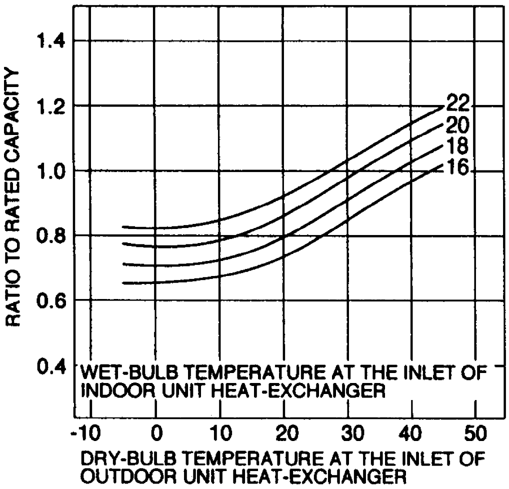
14. CAPACITY AND POWER CONSUMPTION

14.1. COOLING CAPACITY CURVE, COOLING POWER CONSUMPTION CURVE

- COOLING CAPACITY CURVE



- COOLING POWER CONSUMPTION CURVE



- **RATED COOLING CAPACITY, RATED COOLING POWER / CONSUMPTION**

MODEL NAME	RATED COOLING STANDARD	
	CAPACITY (kW)	POWER CONSUMPTION (kW)
CS-A24BD1P/CU-A24BBP5	6.50	2.59
CS-A28BD1P/CU-A28BBP5	7.30	2.69
CS-A28BD1P/CU-A28BBP8	7.30	2.69
CS-A34BD1P/CU-A34BBP5	10.45	3.95
CS-A34BD1P/CU-A34BBP8	10.45	3.65
CS-A43BD1P/CU-A43BBP8	13.00	4.53
CS-A50BD1P/CU-A50BBP8	14.50	5.10

- Calculation of actual cooling capacity and power consumption

Example / CS-A28BD1P / CU-A 28BBP8

- **Calculation of the actual cooling capacity and power consumption for the following cooling conditions: Indoor temperature of 18°C (wet-bulb temperature) and outdoor temperature of 40°C (dry-bulb temperature).**

Calculation method

- **Find the cooling capacity ratio and power consumption ratio from the cooling capacity graph and power consumption graph for model CS-A28BD2P / CU-A28BBP8.**

1. **The cooling capacity ratio indicated at the intersection between an outdoor unit heat exchanger inlet air temperature of 40°C on the horizontal axis and an indoor unit heat exchanger inlet temperature on 18°C is 0.92.**
2. **The cooling power consumption ratio from the same intersection on the power consumption graph is 1.02.**

- **Thus, / Actual cooling capacity = cooling capacity ratio x rated cooling = 0.92 x 7.80 = 7.18 (kW)**
  Actual cooling power consumption = cooling power consumption x rated power consumption = 1.02 x 2.70 = 2.75 (kW)

14.2. PERFORMANCE DATA

Model

CS-A24BD1P/CU-A24BBP5

COOLING PERFORMANCE

Ambient Return Air		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			45°C		
		TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IP
D.B.	W.B.	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
23	17	7.37	6.85	2.28	7.09	6.73	2.45	6.73	6.60	2.61	6.31	6.31	2.78	5.81	5.81	2.9
	19	7.72	5.95	2.45	7.44	5.88	2.61	7.09	5.74	2.78	6.73	5.59	2.95	6.31	5.36	3.0
	22	8.36	4.60	2.72	8.08	4.60	2.86	7.72	4.56	3.03	7.37	4.50	3.17	6.94	4.37	3.3
25	17	7.32	6.81	2.28	7.04	6.69	2.45	6.69	6.55	2.61	6.27	6.27	2.78	5.77	5.77	2.9
	19	7.67	5.91	2.45	7.39	5.84	2.61	7.04	5.70	2.78	6.69	5.55	2.95	6.27	5.33	3.0
	22	8.31	4.57	2.72	8.03	4.58	2.86	7.67	4.53	3.03	7.32	4.47	3.17	6.90	4.35	3.3
27	17	7.28	6.77	2.28	7.00	6.65	2.45	6.65	6.52	2.61	6.23	6.23	2.78	5.74	5.74	2.9
	19	7.63	5.88	2.45	7.35	5.81	2.61	7.00	5.67	2.78	6.65	5.52	2.95	6.23	5.30	3.0
	22	8.26	4.54	2.72	7.98	4.55	2.86	7.63	4.50	3.03	7.28	4.44	3.17	6.86	4.32	3.3
29	17	7.24	6.74	2.28	6.96	6.62	2.45	6.62	6.48	2.61	6.20	6.20	2.78	5.71	5.71	2.9
	19	7.59	5.84	2.45	7.31	5.78	2.61	6.96	5.64	2.78	6.62	5.49	2.95	6.20	5.27	3.0
	22	8.22	4.52	2.72	7.94	4.53	2.86	7.59	4.48	3.03	7.24	4.42	3.17	6.82	4.30	3.3
32	17	7.18	6.68	2.28	6.91	6.56	2.45	6.56	6.43	2.61	6.15	6.15	2.78	5.66	5.66	2.9
	19	7.53	5.80	2.45	7.25	5.73	2.61	6.91	5.60	2.78	6.56	5.45	2.95	6.15	5.23	3.0
	22	8.15	4.48	2.72	7.88	4.49	2.86	7.53	4.44	3.03	7.18	4.38	3.17	6.77	4.27	3.3

Legend: BF Bypass Factor 0.20 SHC Sensible Heat Capacity TC Total Cooling Capacity / CAPACITY SELECTION NOTES / (1) The table above is based on unit nominal evaporator airflow, / correction factor must therefore be applied for selections / away from this condition. /

COOLING CORRECTION FACTORS				
EVAP. AIR FLOW m3/ min (l/s)	22 (367)	25 (417)	28 (467)	31 (517)
SHC Sensible Heat Capacity	0.91	1.0	1.09	1.17
TC Total Cooling Capacity	0.93	1.0	1.07	1.14

Model
CS-A28BD1P/CU-A28BBP5, CU-A28BBP8

COOLING PERFORMANCE

Ambient Return Air		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			45°C		
		TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IP
D.B.	W.B.	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
23	17	8.21	7.80	2.36	7.90	7.66	2.53	7.50	7.50	2.71	7.03	7.03	2.88	6.47	6.47	3.0
	19	8.61	6.80	2.53	8.29	6.72	2.71	7.90	6.55	2.88	7.50	6.38	3.05	7.03	6.11	3.2
	22	9.32	5.31	2.82	9.00	5.31	2.97	8.61	5.25	3.14	8.21	5.17	3.28	7.74	5.03	3.4
25	17	8.16	7.75	2.36	7.85	7.61	2.53	7.45	7.45	2.71	6.98	6.98	2.88	6.43	6.43	3.0
	19	8.55	6.76	2.53	8.24	6.67	2.71	7.85	6.51	2.88	7.45	6.34	3.05	6.98	6.07	3.2
	22	9.26	5.28	2.82	8.94	5.28	2.97	8.55	5.22	3.14	8.16	5.14	3.28	7.69	5.00	3.4
27	17	8.11	7.71	2.36	7.80	7.57	2.53	7.41	7.41	2.71	6.94	6.94	2.88	6.40	6.40	3.0
	19	8.50	6.72	2.53	8.19	6.63	2.71	7.80	6.47	2.88	7.41	6.30	3.05	6.94	6.04	3.2
	22	9.20	5.25	2.82	8.89	5.25	2.97	8.50	5.19	3.14	8.11	5.11	3.28	7.64	4.97	3.4
29	17	8.07	7.67	2.36	7.76	7.53	2.53	7.37	7.37	2.71	6.91	6.91	2.88	6.36	6.36	3.0
	19	8.46	6.68	2.53	8.15	6.60	2.71	7.76	6.44	2.88	7.37	6.27	3.05	6.91	6.01	3.2
	22	9.16	5.22	2.82	8.85	5.22	2.97	8.46	5.16	3.14	8.07	5.08	3.28	7.60	4.94	3.4
32	17	8.01	7.61	2.36	7.70	7.47	2.53	7.31	7.31	2.71	6.85	6.85	2.88	6.31	6.31	3.0
	19	8.39	6.63	2.53	8.08	6.55	2.71	7.70	6.39	2.88	7.31	6.22	3.05	6.85	5.96	3.2
	22	9.08	5.18	2.82	8.78	5.18	2.97	8.39	5.12	3.14	8.01	5.04	3.28	7.54	4.90	3.4

Legend: BF Bypass Factor 0.19 SHC Sensible Heat Capacity TC Total Cooling Capacity / CAPACITY SELECTION NOTES / (1) The table above is based on unit nominal evaporator airflow, / correction factor must therefore be applied for selections / away from this condition. /

COOLING CORRECTION FACTORS				
EVAP. AIR FLOW m3/ min (l/s)	**27 (450)**	**30 (500)**	**33 (550)**	**36 (600)**
SHC Sensible Heat Capacity	**0.91**	**1.0**	**1.09**	**1.17**
TC Total Cooling Capacity	**0.93**	**1.0**	**1.07**	**1.14**

Model
CS-A34BD1P/CU-A34BBP5, CU-A34BBP8

COOLING PERFORMANCE

Ambient Return Air		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			45°C		
		TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IP
D.B.	W.B.	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	k
23	17	11.58	10.31	3.55	11.14	10.13	3.81	10.58	9.94	4.07	9.91	9.51	4.33	9.13	9.13	4.5
	19	12.14	8.86	3.81	11.69	8.77	4.07	11.14	8.57	4.33	10.58	8.36	4.59	9.91	8.03	4.8
	22	13.14	6.70	4.24	12.69	6.73	4.46	12.14	6.68	4.72	11.58	6.60	4.94	10.91	6.44	5.2
25	17	11.51	10.24	3.55	11.06	10.07	3.81	10.51	9.88	4.07	9.85	9.45	4.33	9.07	9.07	4.5
	19	12.06	8.80	3.81	11.62	8.71	4.07	11.06	8.52	4.33	10.51	8.30	4.59	9.85	7.98	4.8
	22	13.06	6.66	4.24	12.61	6.68	4.46	12.06	6.63	4.72	11.51	6.56	4.94	10.84	6.40	5.2
27	17	11.44	10.18	3.55	11.00	10.01	3.81	10.45	9.82	4.07	9.79	9.40	4.33	9.02	9.02	4.5
	19	11.99	8.75	3.81	11.55	8.66	4.07	11.00	8.47	4.33	10.45	8.26	4.59	9.79	7.93	4.8
	22	12.98	6.62	4.24	12.54	6.65	4.46	11.99	6.59	4.72	11.44	6.52	4.94	10.78	6.36	5.2
29	17	11.38	10.13	3.55	10.94	9.96	3.81	10.40	9.77	4.07	9.74	9.35	4.33	8.97	8.97	4.5
	19	11.93	8.71	3.81	11.49	8.62	4.07	10.94	8.43	4.33	10.40	8.21	4.59	9.74	7.89	4.8
	22	12.91	6.59	4.24	12.48	6.61	4.46	11.93	6.56	4.72	11.38	6.49	4.94	10.72	6.33	5.2
32	17	11.29	10.05	3.55	10.86	9.88	3.81	10.31	9.69	4.07	9.66	9.28	4.33	8.90	8.90	4.5
	19	11.83	8.64	3.81	11.40	8.55	4.07	10.86	8.36	4.33	10.31	8.15	4.59	9.66	7.83	4.8
	22	12.81	6.53	4.24	12.38	6.56	4.46	11.83	6.51	4.72	11.29	6.44	4.94	10.64	6.28	5.2

Legend: BF Bypass Factor 0.22 SHC Sensible Heat Capacity TC Total Cooling Capacity / CAPACITY SELECTION NOTES / (1) The table above is based on unit nominal evaporator airflow, / correction factor must therefore be applied for selections / away from this condition. /

COOLING CORRECTION FACTORS				
EVAP. AIR FLOW m3/ min (l/s)	34(567)	38 (633)	42 (700)	46 (767)
SHC Sensible Heat Capacity	0.91	0.95	1.0	1.05
TC Total Cooling Capacity	0.93	0.97	1.0	1.03

Model
CS-A43BD1P/CU-A43BBP8

COOLING PERFORMANCE

Ambient Return Air		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			45°C		
		TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IP
D.B.	W.B.	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
23	17	14.32	12.74	4.52	13.77	12.53	4.85	13.08	12.29	5.18	12.25	11.76	5.51	11.29	11.29	5.7
	19	15.01	10.95	4.85	14.46	10.84	5.18	13.77	10.60	5.51	13.08	10.33	5.84	12.25	9.92	6.1
	22	16.25	8.29	5.40	15.69	8.32	5.68	15.01	8.25	6.01	14.32	8.16	6.28	13.49	7.96	6.6
25	17	14.23	12.66	4.52	13.68	12.45	4.85	13.00	12.22	5.18	12.17	11.69	5.51	11.22	11.22	5.7
	19	14.91	10.88	4.85	14.36	10.77	5.18	13.68	10.53	5.51	13.00	10.27	5.84	12.17	9.86	6.1
	22	16.14	8.23	5.40	15.59	8.26	5.68	14.91	8.20	6.01	14.23	8.11	6.28	13.41	7.91	6.6
27	17	14.14	12.73	4.52	13.60	12.51	4.85	12.92	12.27	5.18	12.10	11.74	5.51	11.15	11.15	5.7
	19	14.82	10.97	4.85	14.28	10.85	5.18	13.60	10.61	5.51	12.92	10.34	5.84	12.10	9.93	6.1
	22	16.05	8.34	5.40	15.50	8.37	5.68	14.82	8.30	6.01	14.14	8.20	6.28	13.33	8.00	6.6
29	17	14.07	12.52	4.52	13.53	12.31	4.85	12.85	12.08	5.18	12.04	11.56	5.51	11.09	11.09	5.7
	19	14.75	10.77	4.85	14.21	10.65	5.18	13.53	10.42	5.51	12.85	10.15	5.84	12.04	9.75	6.1
	22	15.96	8.14	5.40	15.42	8.17	5.68	14.75	8.11	6.01	14.07	8.02	6.28	13.26	7.82	6.6
32	17	13.96	12.42	4.52	13.42	12.21	4.85	12.75	11.99	5.18	11.95	11.47	5.51	11.01	11.01	5.7
	19	14.63	10.68	4.85	14.09	10.57	5.18	13.42	10.33	5.51	12.75	10.07	5.84	11.95	9.68	6.1
	22	15.84	8.08	5.40	15.30	8.11	5.68	14.63	8.05	6.01	13.96	7.96	6.28	13.15	7.76	6.6

Legend: BF Bypass Factor 0.21 SHC Sensible Heat Capacity TC Total Cooling Capacity / CAPACITY SELECTION NOTES / (1) The table above is based on unit nominal evaporator airflow, / correction factor must therefore be applied for selections / away from this condition. /

COOLING CORRECTION FACTORS				
EVAP. AIR FLOW m3/ min (l/s)	42(700)	46 (767)	50 (833)	54 (900)
SHC Sensible Heat Capacity	**0.91**	**0.95**	**1**	**1.05**
TC Total Cooling Capacity	**0.93**	**0.97**	**1**	**1.03**

Model
CS-A50BD1P/CU-A50BBP8

COOLING PERFORMANCE

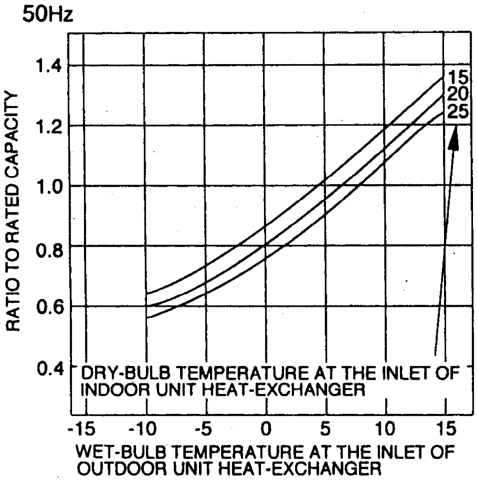
Ambient Return Air		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			45°C		
		TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IP
D.B.	W.B.	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
23	17	15.27	14.20	5.00	14.68	13.94	5.37	13.94	13.67	5.73	13.06	13.06	6.10	12.04	12.04	6.4
	19	16.00	12.32	5.37	15.41	12.18	5.73	14.68	11.89	6.10	13.94	11.57	6.47	13.06	11.10	6.7
	22	17.32	9.53	5.98	16.73	9.54	6.28	16.00	9.44	6.65	15.27	9.31	6.95	14.38	9.06	7.3
25	17	15.17	14.11	5.00	14.58	13.86	5.37	13.86	13.58	5.73	12.98	12.98	6.10	11.96	11.96	6.4
	19	15.90	12.24	5.37	15.31	12.10	5.73	14.58	11.81	6.10	13.86	11.50	6.47	12.98	11.03	6.7
	22	17.21	9.47	5.98	16.63	9.48	6.28	15.90	9.38	6.65	15.17	9.25	6.95	14.29	9.00	7.3
27	17	15.08	14.02	5.00	14.50	13.78	5.37	13.78	13.50	5.73	12.91	12.91	6.10	11.89	11.89	6.4
	19	15.81	12.17	5.37	15.23	12.03	5.73	14.50	11.75	6.10	13.78	11.43	6.47	12.91	10.97	6.7
	22	17.11	9.41	5.98	16.53	9.42	6.28	15.81	9.32	6.65	15.08	9.20	6.95	14.21	8.95	7.3
29	17	15.00	13.95	5.00	14.42	13.70	5.37	13.70	13.43	5.73	12.84	12.84	6.10	11.83	11.83	6.4
	19	15.72	12.11	5.37	15.15	11.97	5.73	14.42	11.68	6.10	13.70	11.37	6.47	12.84	10.91	6.7
	22	17.02	9.36	5.98	16.44	9.37	6.28	15.72	9.28	6.65	15.00	9.15	6.95	14.14	8.91	7.3
32	17	14.88	13.84	5.00	14.31	13.59	5.37	13.59	13.32	5.73	12.74	12.74	6.10	11.73	11.73	6.4
	19	15.60	12.01	5.37	15.03	11.87	5.73	14.31	11.59	6.10	13.59	11.28	6.47	12.74	10.83	6.7
	22	16.89	9.29	5.98	16.31	9.30	6.28	15.60	9.20	6.65	14.88	9.08	6.95	14.02	8.83	7.3

Legend: BF Bypass Factor 0.22 SHC Sensible Heat Capacity TC Total Cooling Capacity / CAPACITY SELECTION NOTES / (1) The table above is based on unit nominal evaporator airflow, / correction factor must therefore be applied for selections / away from this condition. /

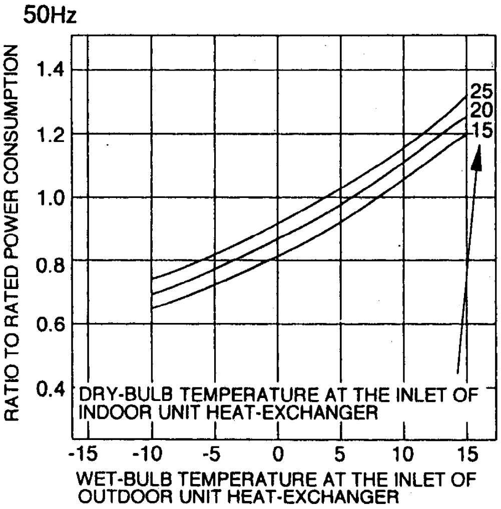
COOLING CORRECTION FACTORS				
EVAP. AIR FLOW m3/ min (l/s)	55 (917)	59 (983)	63 (1050)	67 (1117)
SHC Sensible Heat Capacity	0.89	0.93	1.0	1.07
TC Total Cooling Capacity	0.91	0.96	1.0	1.04

14.3. HEATING CAPACITY CURVE, HEATING POWER CONSUMPTION CURVE (HEAT PUMP MODEL ONLY)

- HEATING CAPACITY CURVE



● **HEATING POWER CONSUMPTION CURVE**

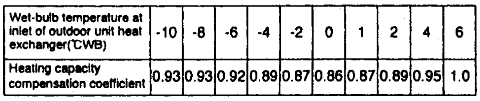


● **RATED HEATING CAPACITY, RATED HEATING POWER / CONSUMPTION**

MODEL NAME	RATED HEATING STANDARD	
	CAPACITY(kW)	POWER CONSUMPTION(kW)
CS-A24BD1P/CU-A24BBP5	7.10	2.50
CS-A28BD1P/CU-A28BBP5	7.75	2.61
CS-A28BD1P/CU-A28BBP8	7.75	2.40
CS-A34BD1P/CU-A34BBP5	11.20	3.55
CS-A34BD1P/CU-A34BBP8	11.20	3.40
CS-A43BD1P/CU-A43BBP8	14.20	3.90
CS-A50BD1P/CU-A50BBP8	15.70	5.09

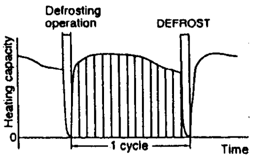
<Precautions on using capacity and electrical characteristics curves>

- **Heating capacity when the unit is frosted over or while being defrosted will vary depending on outdoor temperature ('CW8) and the amount c frost. Heating capacity performance must be compensated because it does not take into account the capacity drop incurred when the unit is frosted over and while it is being defrosted. Therefore, to obtain the integral heating capacity in consideration 01 overfrosting and defrost operations. Heating capacity must be multiplied by the compensation coefficient below.**
- **Heating capacity compensation coefficient for heating in frosted situations.**



Wet-bulb temperature at inlet of outdoor unit heat exchanger(℃WB)	-10	-8	-6	-4	-2	0	1	2	4	6
Heating capacity compensation coefficient	0.93	0.93	0.92	0.89	0.87	0.86	0.87	0.89	0.95	1.0

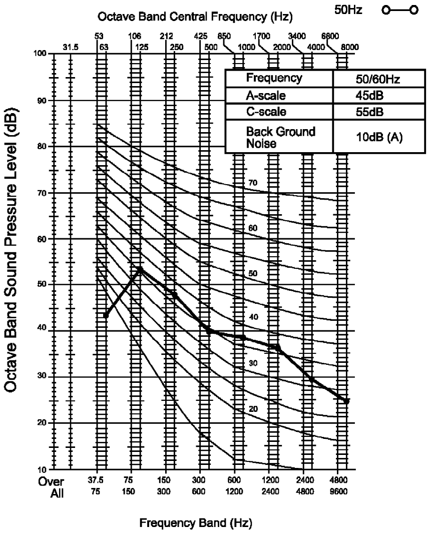
※ 1
Integral heating capacity = (Heating capacity by heating capacity performance) × (Heating capacity compensation coefficient) <kW>



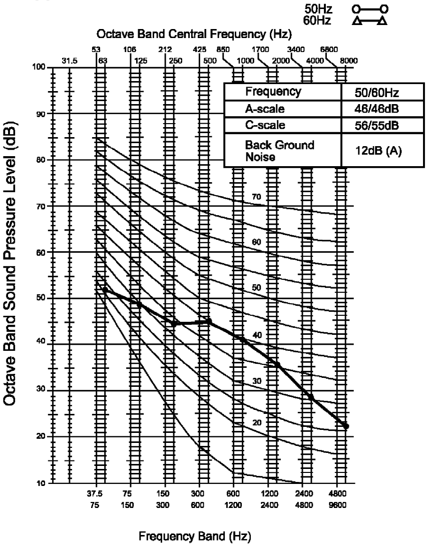
※ 1
Integral heating capacity is obtained by integrating the capacity consumed in 1 defrost cycle into the normal heating capacity, and calculating this value as an hourly figure. One defrost cycle is determined as the time from when a defrost operation stops (heating starts) until the next heating operation starts (see figure on left).

15. SOUND DATA

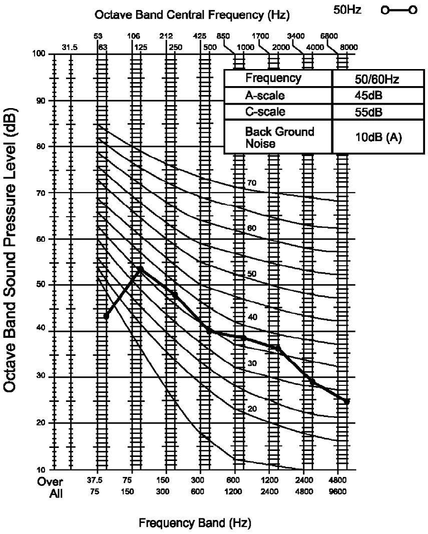
CS-A24BD1P



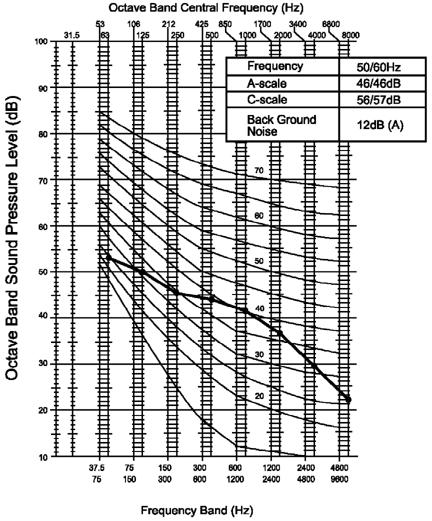
CU-A24BBP1



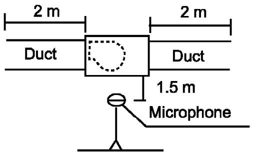
CS-A28BD1P



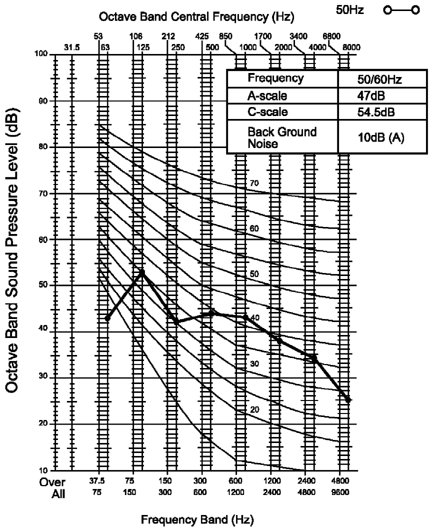
CU-A28BBP5, CU-A28BBP8
(Hi speed)



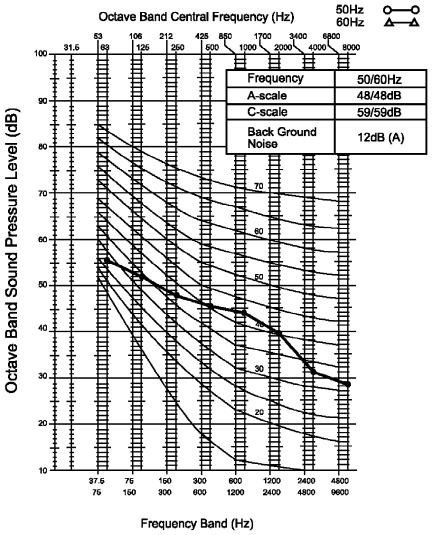
Note:
:Micrphone Position


2 m
2 m
Duct
Duct
1.5 m
Microphone

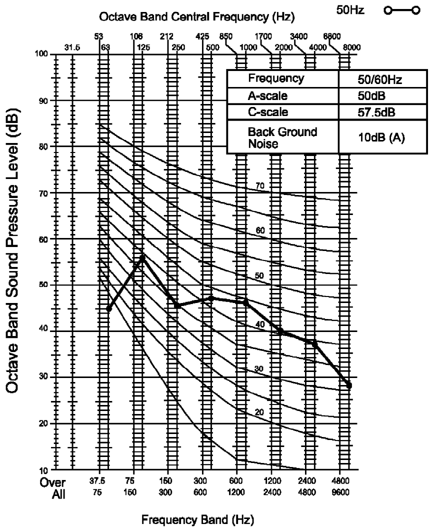
CS-A34BD1P



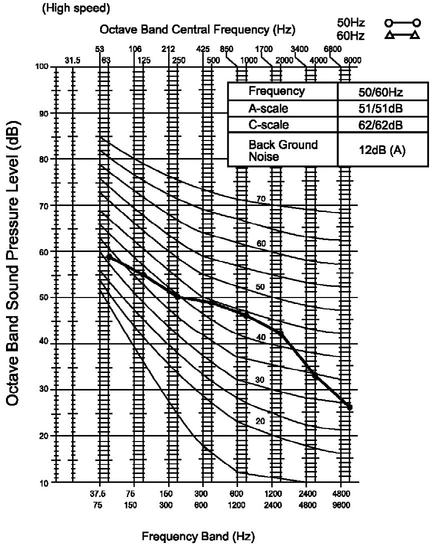
CS-A34BBP5, CS-A34BBP8
(High speed)



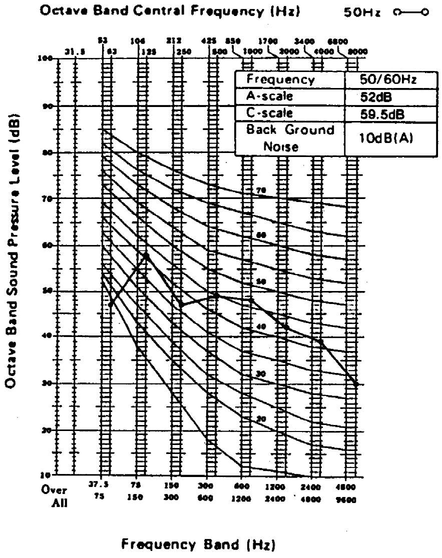
CS-A43BD1P



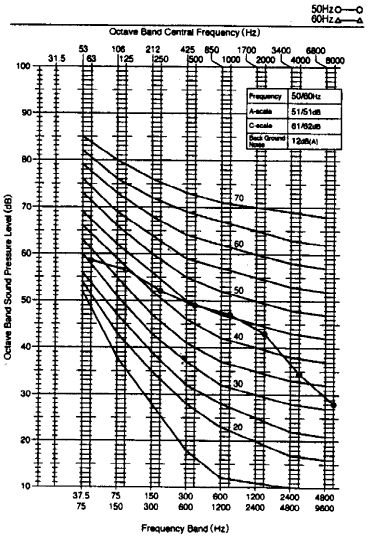
CU-A43BBP8
(High speed)



CS-A50BD1P

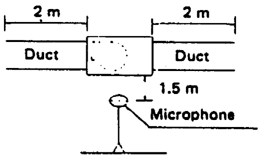


CU-A50BBP8
(Hi speed)



NOTE:

: Microphone Position

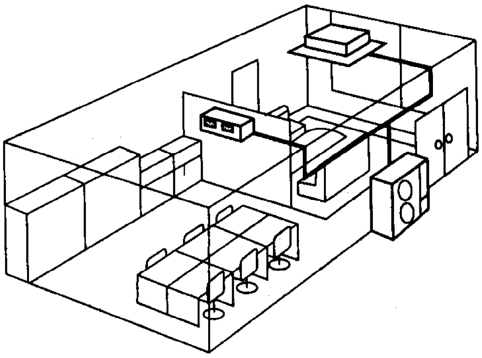


16. TWIN AND TRIPLE

16.1. TWIN

16.1.1. Operation

- **Simultaneous air conditioning of wide spaces and corners is possible.**
- **Master units and slave-units can be set automatically in twin and triple systems. No address setting is necessary.**
- **Multiple indoor units can be operated simultaneously with a single remote control unit. Note that individual operation is not possible.**

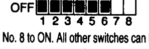


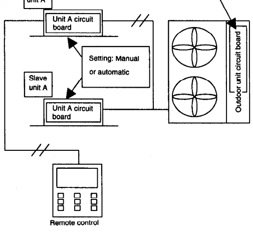
⬭ : Outdoor unit capacity
▭ : Indoor unit capacity
(Figures indicate capacity ratios in combination.)

OUTDOOR UNIT	SIMULTANEOUS TWIN OPERATION
	STANDARD
43BB	43BB 24BD3 24BD3
50BB	50BB 28BD3 28BD3

(Twin operation setting)

- **The master units and slave units are set automatically when the power is turned on. At this time, the indoor unit which is connected to the remote control unit becomes the master unit. / (If automatic setting is not possible, carry out the settings manually.)**
- **Install the remote control unit to the master unit. (It cannot be connected to slave units.)**
- **The remote control thermostat can also be set.**
- **Optional circuit boards can only be installed to the master unit.**
- **Setting the master unit and slave units can also be carried out manually by using DIP switches. However, manual settings will always take priority. If you have made manual settings but would like to return to using automatic settings, set all slave unit DIP switches (refer to the table below) to the OFF position, and then press the ADDRESS RESET switch on the outdoor unit (SW3 on the outdoor unit printed circuit board). / (Do not mix manual settings and automatic settings.)**

	Master unit	Slave unit
Manual setting	※It is not necessary to operate any switches on the master unit. The unit connected to the remote control will become the master unit.	 Set No. 8 to ON. All other switches can be ignored. (No. 7 is already set to ON at the time of shipment.)



Master unit A

Slave unit A

Master and slave unit setting should basically be carried out automatically.
- Setting occurs when the power is turned on.
  (When power for indoor and outdoor units is turned on.)
- Remote control is connected to the master unit.
- Self-diagnosis displays are possible for slave units.
- If setting errors occur because of procedural mistakes or power supply quality problems, the ADDRESS RESET switch function can be used.

/ / / / Automatic address setting for twin system

/ Procedure: Turn on the power supply for the indoor and outdoor units. / Operation: Automatic address setting will start 10 to 30 seconds after the power supply is turned on, and will be completed / after about 1 minute. / /

If the power supplies for the indoor unit and outdoor unit cannot be turned on at the same time, turn on the power supply for the outdoor unit, the indoor unit which is connected to the remote control, and then the other indoor units in that order.

If the order of turning on the power supply is incorrect, the master unit setting may overlap. In such a case, turn on the power supplies for all units in the correct order as given above, or carry out a twin/triple automatic address reset (press dip switch 3 on the outdoor unit continuously for seconds or longer).

- **The indoor unit which is connected to the remote control unit (receptor) will have priority for becoming the master unit.**
- **The master unit thermostat will be used as the indoor temperature thermostat. If the master unit thermostat is turned on, the slave unit thermostats cannot be adjusted even if they happen to be on.**
- **DIP switch settings take priority in the setting of twin and triple addresses.**
- **If address setting using the DIP switches is carried out after automatic address setting has been carried out, use DIP switch No.3 on the outdoor unit to carry out automatic address resetting.**
- **If you would like to designate a particular indoor unit as the master unit because no master unit has been set, use the DIP switches on the slave units to make the setting.**

If automatic address setting is carried out once and then the slave unit addresses are set, the addresses will then be stored inside the EEPROM. Thus it is not necessary to repeat automatic address setting if the power is turned off and back on again.

DIP switch settings for twin slave unit addresses

Procedure:Turn off the power supply, and then set DIP switch 1-8 to ON. / The unit will become slave unit 1. / Turn on the power supply. /

Operation: The unit will operate as slave unit 1. Automatic address setting is not carried out at this time.

If the setting can be made while the power is still turned on, it is easier to mis-combine the setting with group settings. So, the setting be made better while the power is turned off.

- Only slave unit addresses can be set in this way. Master unit setting is not possible.

- If you make the DIP switch settings after the power has been turned back on, carry out twin/triple automatic address resetting.

- Be sure to set DIP switch 1-8 to ON when setting twin/triple addresses. If DIP switch 1-1 is set to ON without setting 1-8 to ON also, group addresses will be set instead, and the remote control open circuit error code (F26) will be displayed.

/ / Automatic address resetting for twin systems

Function

- This clears the current twin addresses which have been set automatically, and causes automatic twin address setting to be carried out once more.

Procedure: Press the ADDRESS RESET switch SW3 (push button switch) on the outdoor unit circuit board continuously / until LEDs 2 to 8 on the outdoor unit circuit board are all illuminated (takes approx. 3.5 seconds).

Operation: The outdoor unit will reset the addresses for the indoor units which it is connected to, and will send an instruction / to carry out automatic address setting again. If the indoor unit DIP switches have not been manually set for / twin address setting, the indoor units receive this command and they then clear their existing settings and carry / out automatic address setting.

If an indoor unit has had its address set by the DIP switch (DIP switch 1-8 is ON), or if the remote control unit is connected to one of the indoor units, then the addresses for those indoor units cannot be reset.

- The indoor units will not run for approximately 1 minute while automatic twin address resetting is being carried out.

- Do not turn off the power supply for at least 1 minute after automatic twin address resetting has been carried out.

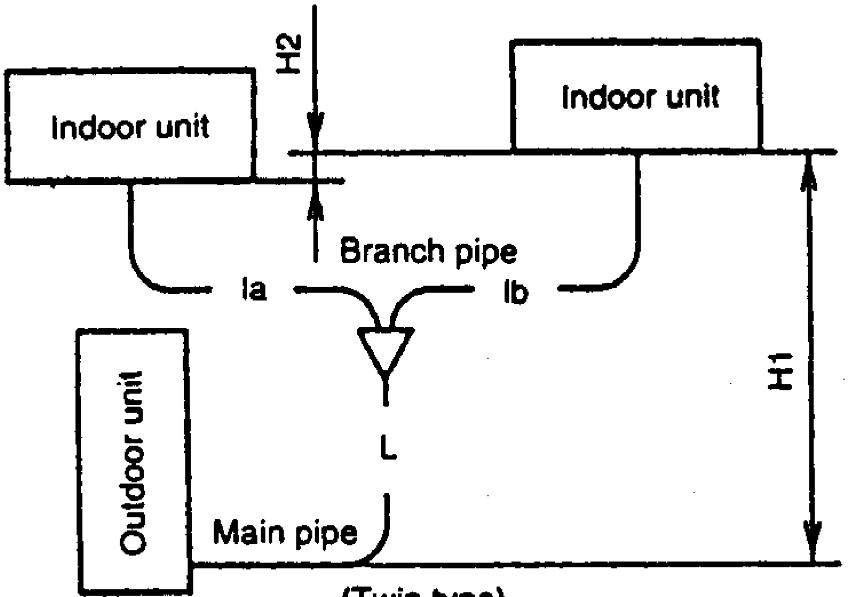
16.2. Piping connections

- The following table shows the pipe diameters for a twin-type system. /

Outdoor unit main pipe diameter (mm)			Indoor unit combinations	
43BB Liquid side: ϕ9.52 Gas side: ϕ19.05	Indoor unit capacity		24BD1	24BD1
	Branch pipe diameter	Liquid side	ϕ6.35	ϕ6.35
		Gas side	ϕ15.88	ϕ15.88
50BB Liquid side: ϕ9.52 Gas side: ϕ19.05	Indoor unit capacity		28BD1	28BD1
	Branch pipe diameter	Liquid side	ϕ9.52	ϕ9.52
		Gas side	ϕ15.88	ϕ15.88

- **The following table shows the equivalent pipe lengths and height differences for twin-and triple-type systems**

Equivalent length	L + la + lb				Within 50 m
Branch pipe diameter	la, lb				Within 15 m
Branch pipe difference	la - lb				Within 10 m
Height difference	H1	Within 30 m	Height difference between indoor units	H2	Within 1 m



(Twin type)

※The branch pipe should be horizontal to or perpendicular to the indoor unit.

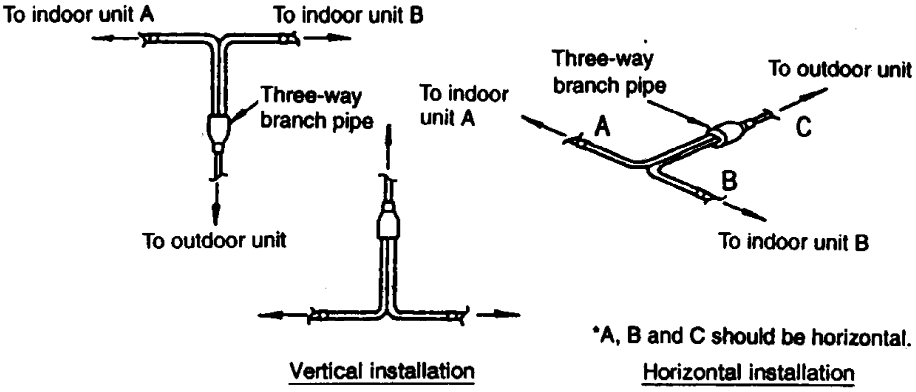
NOTE :

1. Use the main pipe to gain any rise or fall / required for the pipes.

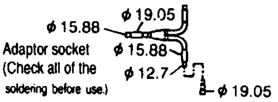
2. The number of bends should be 8 or less in a single system (L + Ia, L + Ib, L + Ic), and 15 or less overall.

3. Branch pipes should be positioned horizontally.

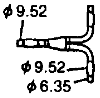
- The branch pipe should be horizontal to or perpendicular to the / indoor unit.


To indoor unit A
To indoor unit B
Three-way branch pipe
To outdoor unit
To indoor unit A
Vertical installation
Three-way branch pipe
To outdoor unit
A
C
B
To indoor unit B
*A, B and C should be horizontal.
Horizontal installation

● **Installing branch pipes**

<table>
<tr><th></th><th colspan="2">Outdoor unit side (outer diameter)</th><th>Branch pipe (inner diameter)</th><th colspan="2">Indoor unit side (outer diameter)</th></tr>
<tr><td rowspan="3">Gas side</td><td>φ15.88</td><td>——</td><td rowspan="3">

φ19.05
φ15.88
Adaptor socket (Check all of the soldering before use.)
φ15.88
φ12.7
φ19.05

</td><td>φ12.7</td><td>——</td></tr>
<tr><td rowspan="2">φ19.05</td><td rowspan="2">Cut</td><td>φ15.88</td><td>Cut</td></tr>
<tr><td>φ19.05</td><td>Adaptor socket</td></tr>
<tr><td rowspan="2">Liquid side</td><td rowspan="2">φ9.52</td><td rowspan="2">——</td><td rowspan="2">

φ9.52
φ9.52
φ6.35

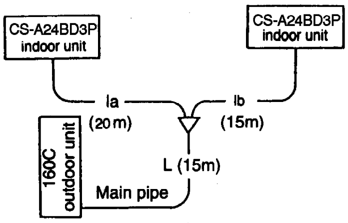
</td><td>φ6.35</td><td>——</td></tr>
<tr><td>φ9.52</td><td>Cut</td></tr>
</table>

16.3. Refrigerant charging

- For twin- and triple-type systems / The pipe length is the total of the branch pipe (L) and the junction pipes (Ia → t Ib → t Ic in order from the thickest diameter)). At the / point where the pipe length exceeds 30 m, determine the amount of refrigerant for the remaining liquid-side pipe diameters and / pipe lengths from the following table in order to charge the system.

Liquid-side pipe diameter	φ6.35	φ9.52
Additional charging amount (kg/m)	0.02	0.05

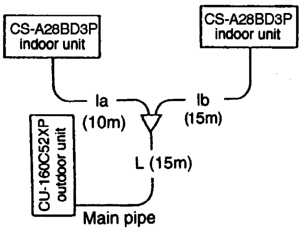
Example 1: For 50BB outdoor unit with an equivalent pipe length of 50 m


CS-A24BD3P indoor unit
CS-A24BD3P indoor unit
la
lb
(20m)
(15m)
160C outdoor unit
L (15m)
Main pipe

(Triple type)

		Liquid pipe diameter	Equivalent lehgth	Additional charging amount for each pipe(kg)
Main pipe (L)		9.52	15m	Not needed if within 30m
Main pipe	(la)	6.35	20m	If exceeds 30 m, 5m×0.02=0.1
	(lb)	6.35	15m	If exceeds 30 m, 15m×0.02=0.3
———			50m	Total 0.4 kg

Example 2: For 50BB outdoor unit with an equivalent pipe length of 40 m

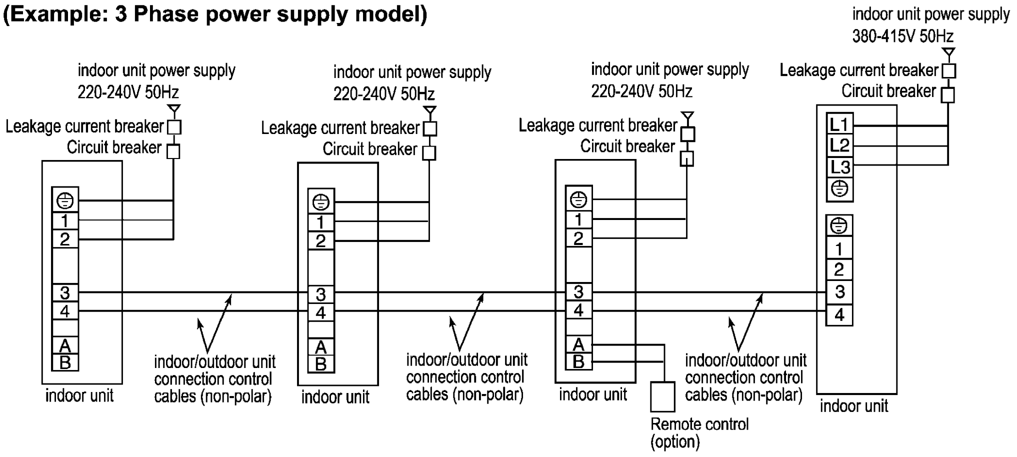

CS-A28BD3P indoor unit
CS-A28BD3P indoor unit
la
lb
(10m)
(15m)
CU-160C52XP outdoor unit
L (15m)
Main pipe

(Twin type)

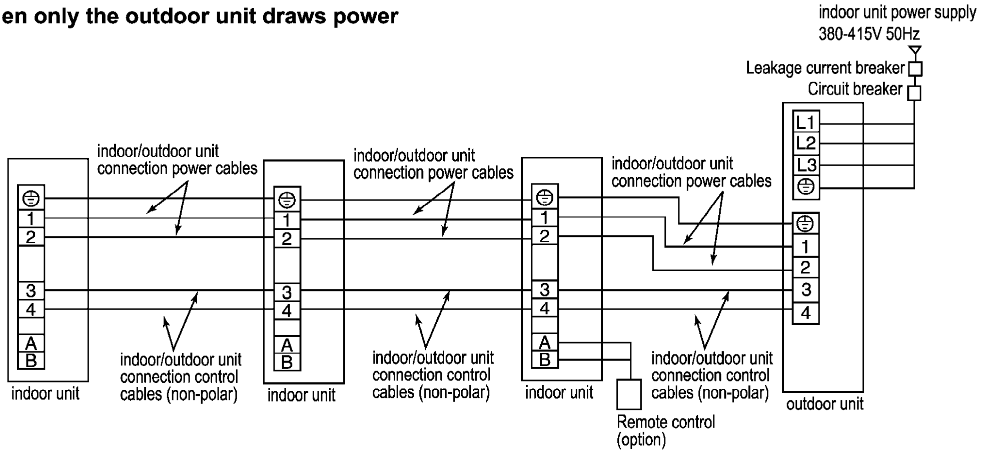
		Liquid pipe diameter	Equivalent length	Additional charging amount for each pipe(kg)
Main pipe (L)		9.52	15m	Not needed if within 30m
Main pipe	(la)	9.52	10m	Not needed if within 30m
	(lb)	9.52	15m	If exceeds 30 m, 10m×0.05=0.5
———			40m	Total 0.5 kg

16.4. Wiring

When both indoor and outdoor unit draw power
(Example: 3 Phase power supply model)

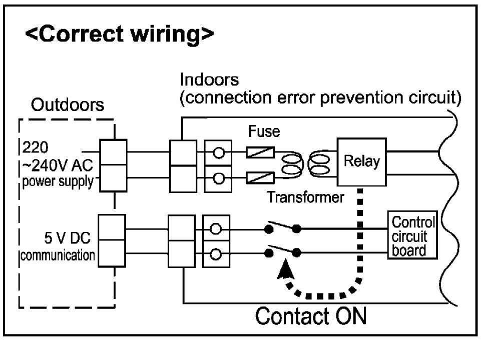

indoor unit power supply
220-240V 50Hz
Leakage current breaker
Circuit breaker
indoor unit power supply
380-415V 50Hz
L1
L2
L3
1
2
3
4
A
B
indoor unit
indoor/outdoor unit
connection control
cables (non-polar)
Remote control
(option)

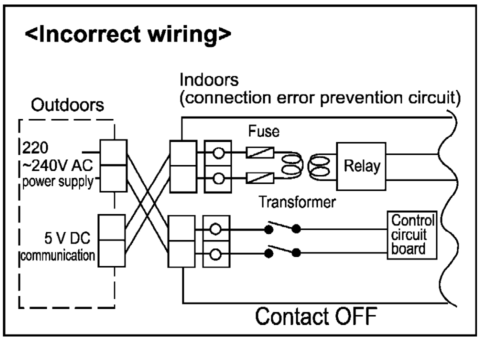
When only the outdoor unit draws power


indoor unit power supply
380-415V 50Hz
Leakage current breaker
Circuit breaker
indoor/outdoor unit
connection power cables
L1
L2
L3
1
2
3
4
A
B
indoor unit
indoor/outdoor unit
connection control
cables (non-polar)
outdoor unit
Remote control
(option)

17. WIRING MISTAKE PREVENTION

Improved quality of installation work through adoption of an "Connection error prevention" circuit which prevents wiring mistakes


<Correct wiring>
Outdoors
Indoors
(connection error prevention circuit)
220
~240V AC
power supply
5 V DC
communication
Fuse
Relay
Transformer
Control
circuit
board
Contact ON


<Incorrect wiring>
Outdoors
Indoors
(connection error prevention circuit)
220
~240V AC
power supply
5 V DC
communication
Fuse
Relay
Transformer
Control
circuit
board
Contact OFF

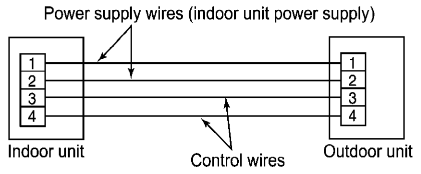
Connection errors with the control wires and the power supply wires will not only contribute to burning-out of the control circuit board, but can also cause large-scale working losses and affect reliability. If a circuit board with a "Connection error prevention" circuit is used, the relay will not operate if the wires have been connected incorrectly, so that current will not flow to the control circuit board. This is designed principally to eliminate human error at the installation site.

Prevention of connection errors

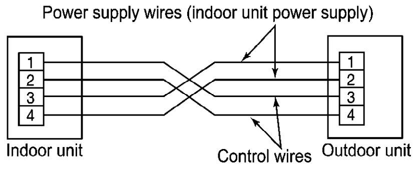
These units are equipped with connection error prevention circuits. If the units do not operate, it

is possible that the connection error prevention circuits have operated. In such cases, check that the power supply wires (connected to terminals [1] and [2] and the control wires (connected to terminals [3] and [4]) are connected correctly. If they are connected incorrectly, connnect them correctly. Normal operation should then commence.

(CORRECT)


Power supply wires (indoor unit power supply)
1
2
3
4
1
2
3
4
Indoor unit
Control wires
Outdoor unit

(INCORRECT)


Power supply wires (indoor unit power supply)
1
2
3
4
1
2
3
4
Indoor unit
Control wires
Outdoor unit

- Do not short the remote control wires to each other. (The protection circuit will be activated and the units will not operate.) Once the cause of the short is eliminated, normal operation will then be possible.

NOTE:

- Wait one minute after turning on the indoor unit power supply before operating the remote control.
- If nothing at all appears in the remote control LCD, check the power supply for the indoor unit. / Refer to “TROUBLE SHOOTING”.

NOTE:

Never do any of the following, as doing so may damage the printed circuit board.

- Do not connect anything except a relay to the timer input or fan speed output (connector CNT1 on printed circuit board).
- Do not connect U-NET transmission wires to terminals 3 and 4 of the indoor and outdoor units. (*1)
- Do not connect U-NET transmission wires to terminals A and B of the remote control. / (*1) U-NET transmission wires are the communication wires used for the central controller.

18. TEST OPERATION AND SELF DIAGNOSIS

18.1. Test operation

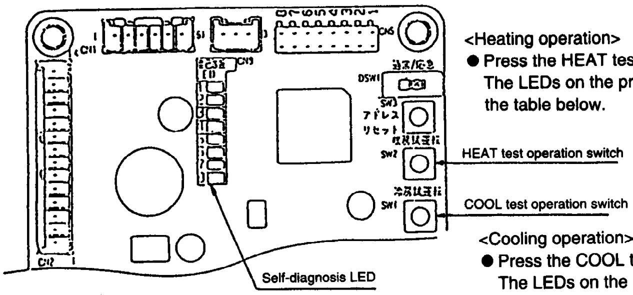
- Always be sure to use a properly-insulated tool to operate the switch on the circuit board. (Do not use your finger or a metallic object).
- Never turn on the power supply until all installation work has been completed.
- Turn on the circuit breaker before test operation extends past 6

hours. / (The crankcase heater will become energized, which will warm the compressor and prevent liquid compression.)

- **For three-phase models, check that the phase is not reversed. / (If the phase is reversed, the LED on the printed circuit board will flash.)**
- **Check that the voltage is 198 V or higher when starting the unit. (The unit will not operate if the voltage is less than 198V.)**
- **Carry out test operation for 5 minutes or more using the remote control or the switch on the outdoor unit printed circuit board.**
- **Always carry out cooling first during test operation, even during the warm season. / (If heating is carried out first, problems with operation of the compressor will result.)**

18.2. Test operation from the outdoor unit

(Outdoor unit printed circuit board)



<Heating operation>
● Press the HEAT test operation switch for 1 second.
The LEDs on the printed circuit board will flash as indicated in the table below.

<Cooling operation>
● Press the COOL test operation switch for 1 second.
The LEDs on the printed circuit board will flash as indicated in the table below.

During outdoor unit emergency operation or test operation, the LEDs on the printed circuit board will flash.

	LEDs on outdoor unit printed circuit board						
	LED2	LED3	LED4	LED5	LED6	LED7	LED8
Emergency operation display			☼	☼	☼		
Cooling test operation from outdoor unit	☼	☼	☼				
Heating test operation from outdoor unit					☼	☼	☼

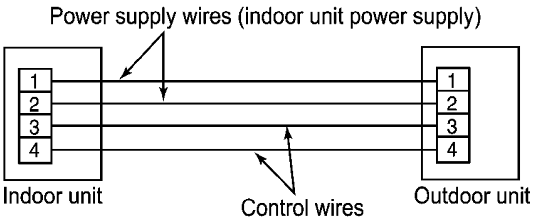
To cancel test operation, press the TEST or RUN button once more while test operation is being carried out. / (Test operation will stop automatically after 30 minutes have passed.)

NOTE:

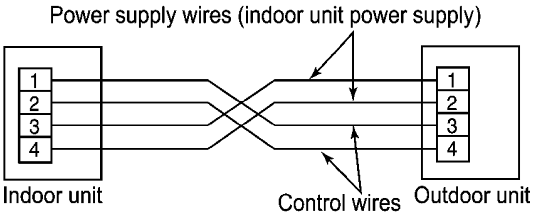
1. **These units are equipped with connection error prevention circuits. If the units do not operate, it is possible that the connection error prevention circuits have operated. In such cases, check that the drive wires (connected to terminals [1] and [2]) and the control wires (connected to terminals [3] and [4]) are connected correctly. If they are connected incorrectly, connect**

them correctly. Normal operation should then commence.

(CORRECT)

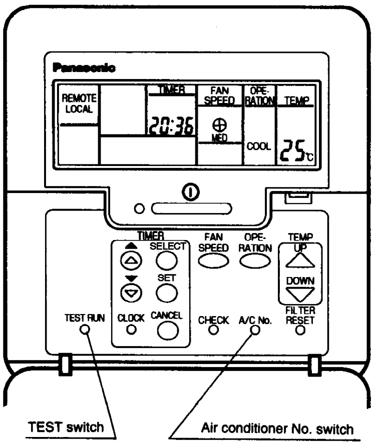

Power supply wires (indoor unit power supply)
1
2
3
4
1
2
3
4
Indoor unit
Control wires
Outdoor unit

(INCORRECT)


Power supply wires (indoor unit power supply)
1
2
3
4
1
2
3
4
Indoor unit
Control wires
Outdoor unit

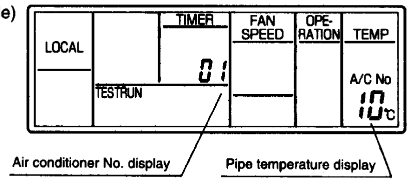
2. **Do not short the remote control unit wires to each other. (The protection circuit will be activated and the units will not operate.) / Once the cause of the short is eliminated, normal operation will then be possible.**

18.3. Test operation using the wired remote control


Panasonic
REMOTE
LOCAL
TIMER
20:36
FAN SPEED
MED
OPE-RATION
COOL
TEMP
25℃
TIMER
SELECT
SET
FAN SPEED
OPE-RATION
TEMP
UP
DOWN
TEST RUN
CLOCK
CANCEL
CHECK
A/C No.
FILTER RESET
TEST switch
Air conditioner No. switch

1. Check that “COOL” is displayed on the operation mode display, and then press the RUN switch to start test operation.
2. Within 1 minute of pressing the RUN switch, press the TEST RUN switch.
3. The pipe temperature (gas pipe) will then be displayed in the temperature setting display of the remote control

(Example)

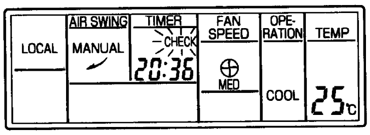

LOCAL
TIMER
01
TESTRUN
FAN SPEED
OPE-RATION
TEMP
A/C No
10℃
Air conditioner No. display
Pipe temperature display

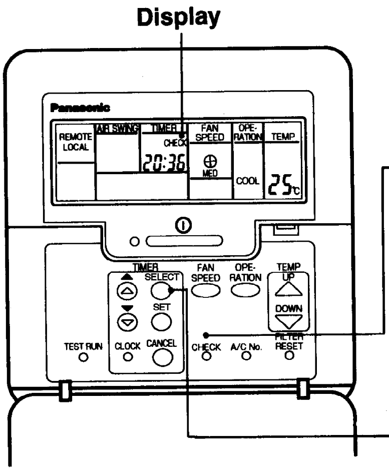
- During group control, the number appearing in the timer display will change each time the air conditioner No. switch is pressed, and the pipe temperature for the indoor unit corresponding to the number displayed will appear in the temperature setting display.

4. Check that the temperature in the pipe temperature display starts dropping after operation has been continuing for some time.
(The temperature will increase during heating operation.)

- The wired remote control display and the self-diagnosis LEDs (red) on the outdoor unit printed circuit board indicate where the abnormality has occurred.
- Recalling the error display

(Example)

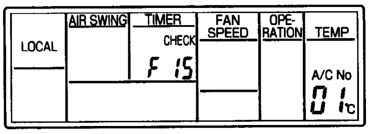

AIR SWING
TIMER
CHECK
FAN SPEED
OPE-RATION
TEMP
LOCAL
MANUAL
20:36
MED
COOL
25℃


Display
Panasonic
REMOTE
LOCAL
AIR SWING
TIMER
CHECK
FAN SPEED
OPE-RATION
TEMP
20:36
MED
COOL
25℃
TIMER
SELECT
FAN SPEED
OPE-RATION
TEMP
UP
SET
DOWN
FILTER RESET
TEST RUN
CLOCK
CANCEL
CHECK
A/C No.

When an abnormality occurs at this unit, "CHECK" flashes in the display.

Press the CHECK switch while the display is flashing.

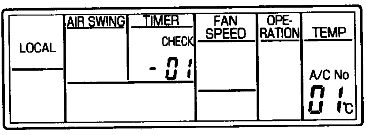
(Example)


AIR SWING
TIMER
CHECK
FAN SPEED
OPE-RATION
TEMP
LOCAL
F 15
A/C No
01℃

The timer display will change and an error code from F15 to F49 will appear in place of the time. (The temperature setting display will also change to show the air conditioner No.)

Press the TIMER ON/OFF switch while the error is displayed.

(Example)


AIR SWING
TIMER
CHECK
FAN SPEED
OPE-RATION
TEMP
LOCAL
- 01
A/C No
01℃

The F15 - F49 display will change to the detail display.

<Air conditioner No.>

- The air conditioner No. "01" appears during normal installation and use. When using group control, a different number may appear. The air conditioner No. can be displayed by pressing the air conditioner No. switch.

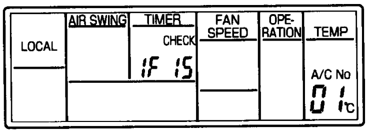
- After checking the error display and the detail display, refer to the self-diagnosis error code table on the following page and check the location of the problem.
- If the problem is repaired and operation returns to normal, the CHECK display on the remote control will put out, but the self-diagnosis LED will remain illuminated until operation starts again.

How to display the past error message

If the "CHECK" display on the wired remote control is not flashing, press the CHECK button continuously for 5 seconds or more to display the problem details for the last problem or the problem before that. You can then switch between the displays for the previous problem and the problem before that by pressing the TIMER, FORWARD or BACK buttons.
(Last problem display: 1F15 - 1F49
Second-last problem display: 2F15 - 2F49)

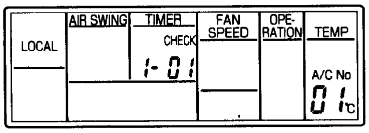
Press the CHECK button once more to return to the normal display.

(Example of last problem display)


AIR SWING
TIMER
CHECK
FAN SPEED
OPE-RATION
TEMP
LOCAL
1F 15
A/C No
01℃

An error code from 1F15 to 1F49 will be displayed.
(The temperature setting display will also change to show the air conditioner No.)

(Example)


AIR SWING
TIMER
CHECK
FAN SPEED
OPE-RATION
TEMP
LOCAL
1- 01
A/C No
01℃

If the TIMER ON/OFF switch is pressed while the error code from 1F15 to 1F49 is being displayed, the display screen will change to show the details of the last problem display.
(If 2F15 to 2F49 is being displayed, the details of the second-last problem display will appear.)

● Self-diagnosis error code table

☼: Flashing ○: Illuminated Blank: Off

Remote control display		Printed circuit board self-diagnosis LED (red)								Error display
Wired		Indoor unit	Outdoor unit							(Check location)
Error display	Detail display	LED2	LED2	LED3	LED4	LED5	LED6	LED7	LED8	
F17	–01	☼	☼	☼			☼	(※2)	(※2)	Option problem Option connection terminals
F20	–01	☼	☼			☼		(※2)	(※2)	Indoor temperature thermistor problem Indoor temperature thermistor lead wire or indoor unit connector CN1
	–02	☼	☼		☼	☼		(※2)	(※2)	Remote control thermistor problem Remote control thermistor
F21	–01	☼		☼		☼		(※2)	(※2)	Pipe temperature thermistor problem (indoor unit side) Pipe temperature thermistor lead wire or indoor unit connector CN1
F25	–01	☼			☼			(※2)	(※2)	Centralised control address overlap problem Check settings for optional centralised control circuit board address switch
F26	–01	☼		☼				(※2)	(※2)	Remote control transmission wire open circuit problem Remote control unit cable and connection terminals
	–02	☼	☼					(※2)	(※2)	Remote control transmission problem Check the transmission wave pattern
F27	–01	☼		☼				☼		Indoor/outdoor unit transmission wire open circuit problem Indoor/outdoor unit connection cable and connection terminals, or indoor unit and outdoor unit power supplies
	–02	☼	☼					☼		Indoor/outdoor unit transmission problem Check the transmission wave pattern.
F29	–01	☼		☼		☼	☼	(※2)	(※2)	Indoor unit setting problem Abnormal setting of the indoor p.c.board.
	–02	☼	☼			☼	☼	(※2)	(※2)	Indoor unit setting problem Abnomal setting of the indoor p.c.board.
	–12	☼	☼		☼	☼	☼	(※2)	(※2)	Remote control unit setting problem Abnomal setting of the remote control.
F30	–02	☼	☼		☼		☼	☼		Negative or open phase power supply Check the main power supply terminal board connections, and switch the main power supply phase.
	–06	☼		☼	☼		☼	☼		Poor power supply connection, or distorted voltage wave pattern Check the main power supply terminal board connections, and check the power supply wave patttern.
	–07	☼	☼	☼	☼		☼	☼		Poor power supply connection Check the main power supply terminal board connections.
F31	–02	☼		☼			☼	☼		High-pressure cut-off Refrigeration system, Obstructing of the heat radiation from outdoor unit
F33	–01	☼	☼				☼	☼		Compressor overcurrent protection Open phase or lock in compressor, or blown main power supply fuse
	–02	☼	☼	☼			☼	☼		Compressor discharge temperature protection Insufficient gas
F40	–41	☼	☼			☼		☼		Compressor discharge temperature thermistor problem Discharge temperature thermistor lead wire, outdoor unit connector CN2, or relay connector
	–61	☼		☼		☼		☼		Heat exchanger outlet temperature thermistor problem (Outdoor unit) Heat exchanger outlet temperature thermistor lead wire, outdoor unit connector CN2, or relay connector
F41	–02	☼	☼		☼	☼		☼		High-pressure switch open circuit problem High-pressure switch lead wire, outdoor unit connector CN2, or relay connector
	–03	☼		☼	☼	☼		☼		Heating pressure switch open circuit problem Heating pressure switch lead wire, outdoor unit connector CN2, or relay connector
F42	–01	☼	☼	☼		☼		☼		Current detector open circuit or compressor current problem Outdoor unit connector CN2, compressor internal protection system activated, or blown main power supply fuse
F49	–01	☼		☼		☼	☼	☼		Outdoor unit setting problem Abnormal setting of the outdoor p.c.board
	–02	☼	☼			☼	☼	☼		Outdoor unit setting problem Abnormal setting of the outdoor p.c.board

If more than one error occurs between the indoor and outdoor units, the problem display on the remote control may not match the LED display on the outdoor unit printed circuit board. In such cases, check both locations and remove the causes of the problems.

(※2)

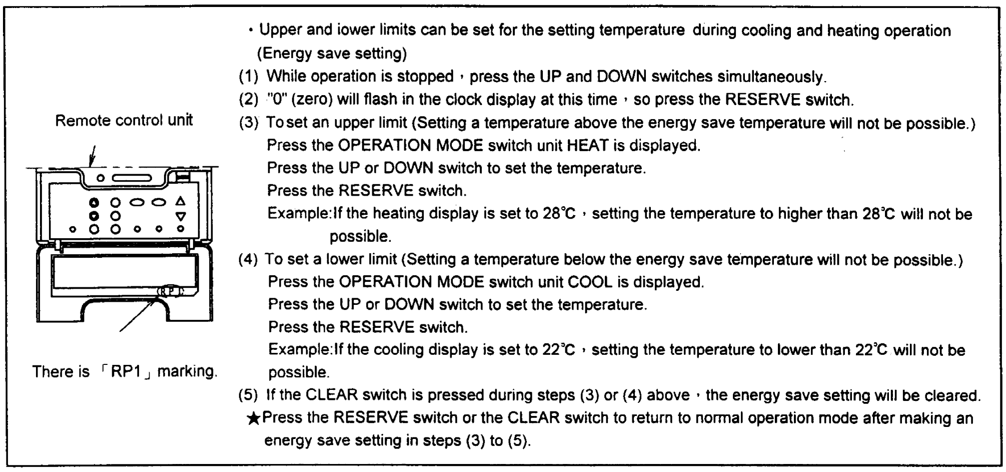
LED7	LED8	Unit display for twin/triple system
		Master unit error
○		Slave unit 1 error
	○	Slave unit 2 error

- The LED1 (green) illuminates to indicate that the microprocessor on the microprocessor circuit board is operating normally. If the LED is switched off or is flashing irregularly, check the power supply, and turn it off and then back on again.

19. SETTING OF SAVE ENERGY AND THERMISTOR SWITCH

19.1. Energy save setting

Open the cover remote control unit and confirm the presence of the [RP1] marking. / Energy save setting method should be different for with [RP1] marking and without [RP1] marking.



Remote control unit

There is 「RP1」 marking.

・Upper and iower limits can be set for the setting temperature during cooling and heating operation (Energy save setting)

(1) While operation is stopped，press the UP and DOWN switches simultaneously.

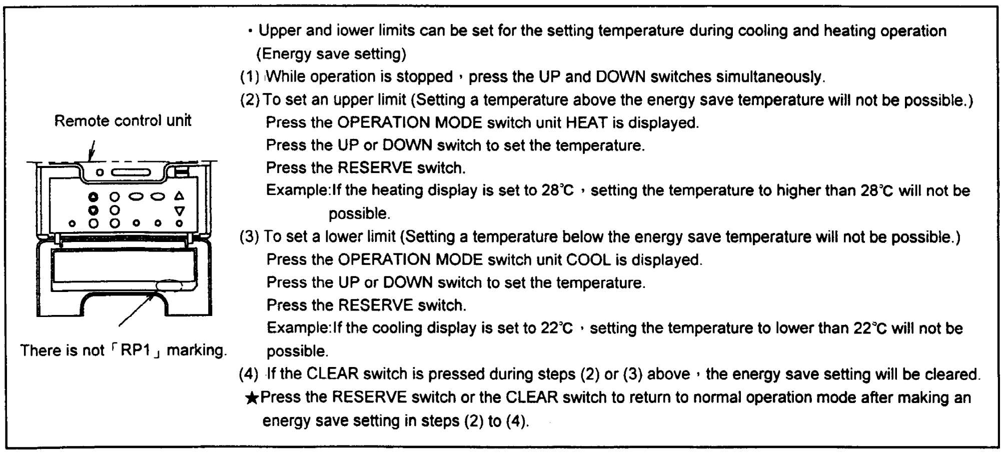
(2) "0" (zero) will flash in the clock display at this time，so press the RESERVE switch.

(3) To set an upper limit (Setting a temperature above the energy save temperature will not be possible.)
Press the OPERATION MODE switch unit HEAT is displayed.
Press the UP or DOWN switch to set the temperature.
Press the RESERVE switch.
Example:If the heating display is set to 28℃，setting the temperature to higher than 28℃ will not be possible.

(4) To set a lower limit (Setting a temperature below the energy save temperature will not be possible.)
Press the OPERATION MODE switch unit COOL is displayed.
Press the UP or DOWN switch to set the temperature.
Press the RESERVE switch.
Example:If the cooling display is set to 22℃，setting the temperature to lower than 22℃ will not be possible.

(5) If the CLEAR switch is pressed during steps (3) or (4) above，the energy save setting will be cleared.

★Press the RESERVE switch or the CLEAR switch to return to normal operation mode after making an energy save setting in steps (3) to (5).



Remote control unit

There is not 「RP1」 marking.

・Upper and iower limits can be set for the setting temperature during cooling and heating operation (Energy save setting)

(1) While operation is stopped，press the UP and DOWN switches simultaneously.

(2) To set an upper limit (Setting a temperature above the energy save temperature will not be possible.)
Press the OPERATION MODE switch unit HEAT is displayed.
Press the UP or DOWN switch to set the temperature.
Press the RESERVE switch.
Example:If the heating display is set to 28℃，setting the temperature to higher than 28℃ will not be possible.

(3) To set a lower limit (Setting a temperature below the energy save temperature will not be possible.)
Press the OPERATION MODE switch unit COOL is displayed.
Press the UP or DOWN switch to set the temperature.
Press the RESERVE switch.
Example:If the cooling display is set to 22℃，setting the temperature to lower than 22℃ will not be possible.

(4) If the CLEAR switch is pressed during steps (2) or (3) above，the energy save setting will be cleared.

★Press the RESERVE switch or the CLEAR switch to return to normal operation mode after making an energy save setting in steps (2) to (4).

20. GROUP CONTROL

1 Setting group for 1 remote control unit

- **When using a remote control thermostat, the thermostat setting is used for all indoor units in the group.**
- **During group control, up to a maximum of 16 indoor units can be connected. (Do not mix heat pump units and cooling-only units.)**
- **Do not mix manual settings and automatic settings. (manual settings take priority.)**
- **The master unit and slave units can all be centrally controlled during group control. /**

Automatic setting for group control

- **If the power supplies for indoor units which are connected are turned on simultaneously, the indoor unit numbers will be determined automatically after approximately 1 minute. (DIP switch settings are not necessary.) /**

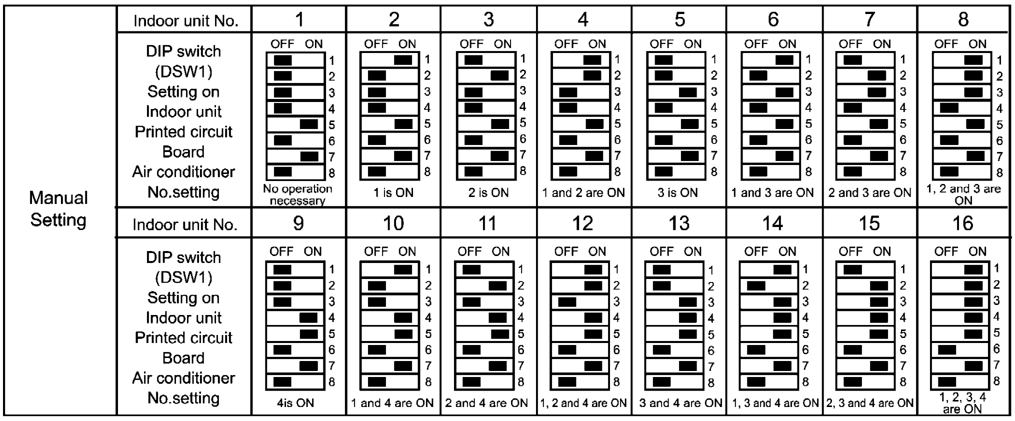
NOTE:

- Correct wiring connections are basic requirements for automatic setting. If the wires are connected incorrectly when the power is turned on, the settings will not be made correctly and operation will not be possible.

- When address numbers are set automatically, you will not know which address number corresponds to which indoor unit.

- Do not turn off the power supply for at least 1 minute during automatic address setting, otherwise the settings will not be made correctly.

(Manual setting for group control)



Manual Setting	Indoor unit No.	1	2	3	4	5	6	7	8
	DIP switch (DSW1) Setting on Indoor unit Printed circuit Board Air conditioner No.setting	No operation necessary	1 is ON	2 is ON	1 and 2 are ON	3 is ON	1 and 3 are ON	2 and 3 are ON	1, 2 and 3 are ON
	Indoor unit No.	9	10	11	12	13	14	15	16
	DIP switch (DSW1) Setting on Indoor unit Printed circuit Board Air conditioner No.setting	4is ON	1 and 4 are ON	2 and 4 are ON	1, 2 and 4 are ON	3 and 4 are ON	1, 3 and 4 are ON	2, 3 and 4 are ON	1, 2, 3, 4 are ON

Automatic address resetting for group control

After setting DIP switches 1 to 4 to OFF and stop operation. Then press the “AIR SWING AUTO” “OPERATION MODE” and “Air conditioner No.” switches simultaneously. Then addresses will be momentarily reset, and then automatic address setting will be carried out once more. /

Switching the thermistor.

- The temperature detection thermistor used for detecting the air temperature and changing between COOL and H EAT operation can be switched between the thermistor at the indoor unit and the thermistor at the remote control unit box. However, do not switch to the remote control unit thermistor if using two remote control units.

1. While operation is stopped, press and hold the STOP/RUN switch, and then press the UP and DOWN / switches together.

2. "DO" or "01" will appear in the time display.

3. Press the FORWARD or BACK timer switches to switch the display between "00" and "01 ". "00" ... Indoor unit setting (factory default) "01" ... Remote control unit setting

4. **Press the RESERVE switch. (Be sure to press the RESERVE switch so that normal operation mode can be resumed.)**

- Repeat the procedure in steps (1) to (4) to change the setting again.

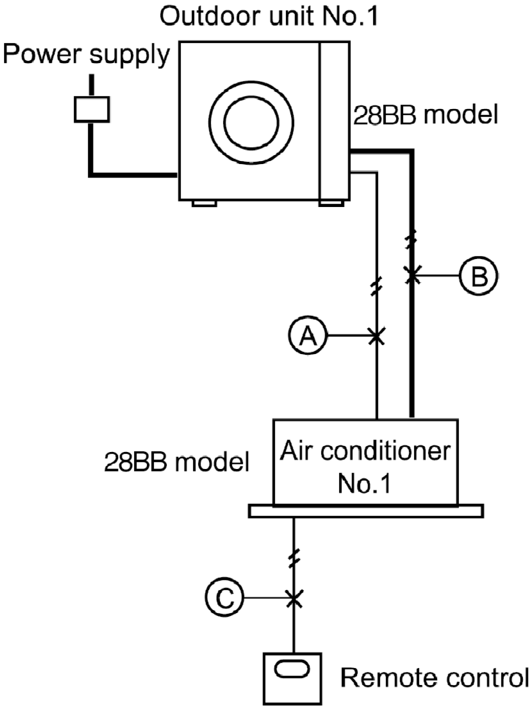
21. TROUBLE SHOOTING

If test operation does not proceed correctly

Carry out test operation after approximately 6 hours have passed since the power was turned on (crankcase heater is energized). If operation is started by using the remote control within 1 minute of turning on the power, the outdoor unit settings will not be made correctly and correct operation will not be possible.

If the following symptoms occur after turning on the power, check the wiring connections once more. /

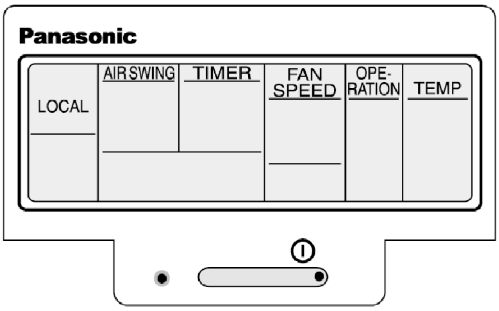
- For standard installation / (System example)



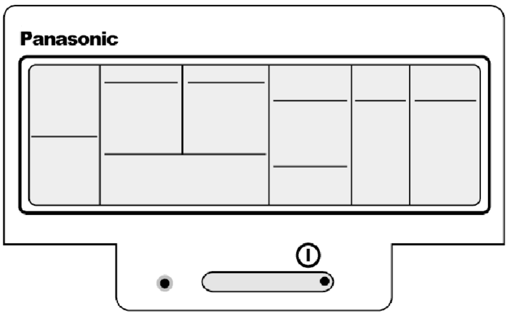
1. **The main power is turned on while the indoor-outdoor transmission wires are not connected (open circuit at section A) / Symptom: / Remote control unit . . . "CHECK" flashes / NOTE: / Indoor unit . . . LED2 on printed circuit board flashes / Outdoor unit . . . LED3 and LED7 on printed circuit board flash /**

2. The main power is turned on while the indoor-outdoor power supply wires are not connected (open circuit at section B) / Symptom: / Remote control unit . . . Display of “No power supply” / NOTE: / Indoor unit . . . No display / Outdoor unit . . . LED3 and LED7 on printed circuit board flash /
3. The main power is turned on while the remote control unit connection cord is not connected (open circuit at section C) / Symptom: / Remote control unit . . . Display of “No power supply” / NOTE: / Indoor unit . . . LED1 on printed circuit board stays illuminated / Outdoor unit . . . LED1 on printed circuit board stays illuminated

/ (When remote control display shows “Power supply”)



(When remote control display shows “No power supply”)



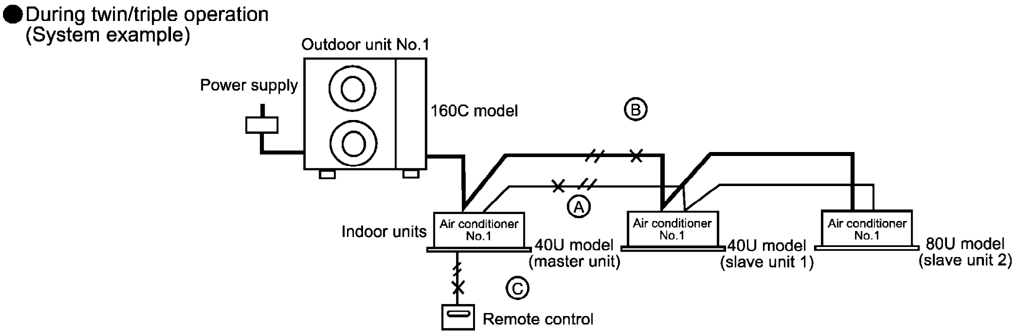
Remedy

1. Turn off the main power. / ↓
2. Connect the disconnected wire correctly. / ↓
3. Turn the main power back on. / ↓
4. After 1 minute, start operation using the remote control. / (Indoor unit . . . Operation will start according to the remote control setting.) / (Outdoor unit . . . Operation will start after 3-5 minutes.)

NOTE: / / The “CHECK” display on the remote control and the flashing of LEDs on the printed circuit boards will not occur

immediately. They will appear 3-6 minutes after the main power is turned on. /

-


During twin/triple operation
(System example)
Outdoor unit No.1
Power supply
160C model
B
A
Indoor units
Air conditioner No.1
40U model
(master unit)
Air conditioner No.1
40U model
(slave unit 1)
Air conditioner No.1
80U model
(slave unit 2)
C
Remote control

1. **The main power is turned on while the transmission wires between the indoor unit(s) are not connected (open circuit at section A) / Symptom: / Nothing abnormal appears on the remote control display. If operation is then started in this condition, the combination of the 160C outdoor unit and the 40U indoor unit (master unit) will cause abnormal operation to occur. / ↓ / If operation continues, an abnormality will occur on the refrigeration cycle and operation will stop.**

    - **Remote control . . . "CHECK" flashes**
    - **Indoor unit (master) . . . The LEDs on the printed circuit board flash and operation stops**
    - **Indoor unit (slave) . . . LED1 on the printed circuit board illuminates and the unit does not operate at all**
    - **Outdoor unit . . . The LEDs on the printed circuit board flash and operation stops /**
2. **The main power is turned on while the power supply wires between the indoor unit(s) are not connected (open circuit at section B) / Symptom: / Same as above. If operation continues, an abnormality will occur on the refrigeration cycle and operation will stop. / ↓**

    - **Remote control . . . "CHECK" flashes**
    - **Indoor unit (master) . . . The LEDs on the printed circuit board flash**
    - **Indoor unit (slave) . . . The LEDs on the printed circuit board do not illuminate and the unit does not operate at all**

- Outdoor unit . . . The LEDs on the printed circuit board flash and operation stops /

3. The main power is turned on while the remote control connection cord is not connected (open circuit at section C) / Symptom:

- Remote control unit . . . Display of “No power supply”
- Indoor unit (master) . . . LED1 on the printed circuit board stays illuminated and the unit does not operate
- Indoor unit (slave) . . . LED1 on the printed circuit board stays illuminated and the unit does not operate
- Outdoor unit . . . LED1 on the printed circuit board stays illuminated and the unit does not operate

/ Remedy

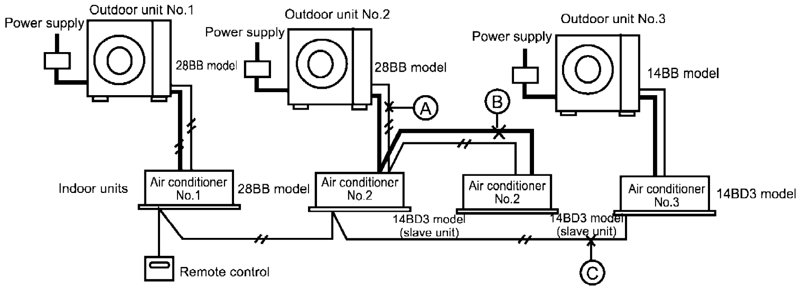
1. Turn off the main power. / ↓
2. Connect the disconnected wires correctly. / ↓
3. Turn the main power back on. / ↓
4. After 1 minute, start operation using the remote control. / (Indoor units . . . Operation will start according to the remote control setting.) / (Outdoor unit . . . Operation will start after 3-5 minutes.)

/ If slave units do not operate even after the wiring has been corrected (automatic addressing is not possible)

1. Check that DIP switches 1 to 4 and DIP switch 8 are all set to OFF, and then stop operation. / ↓
2. Press the ADDRESS RESET button (SW3) at the outdoor unit for approximately 4 seconds / (The self-diagnosis LEDS 2 to 8 will illuminate in order, and the system is reset once they are all illuminated.)

/ The above procedure cannot be used to carry out automatic address resetting during group control. /

● During group control operation
(System example)


Outdoor unit No.1
Power supply
28BB model
Outdoor unit No.2
Power supply
28BB model
A
B
Outdoor unit No.3
Power supply
14BB model
Indoor units
Air conditioner No.1
28BB model
Air conditioner No.2
Air conditioner No.2
14BD3 model (slave unit)
Air conditioner No.3
14BD3 model (slave unit)
14BD3 model
Remote control
C

1. The main power is turned on while the transmission wires between the indoor unit and the outdoor unit are not connected (open circuit at section A) / Symptom: / Operation of indoor unit No. 1 and indoor unit No. 3 is possible. / However, “CHECK” flashes in the remote control unit display for 3-5 minutes after the main power is turned on.

- **Remote control . . . “CHECK” flashes**
- **Indoor unit No. 2 . . . LED2 on the printed circuit board flashes (both master and slave units)**
- **Outdoor unit No. 2 . . . LED3 and LED7 on the printed circuit board flash /**

2. The main power is turned on while the power supply wires between the indoor units are not connected (open circuit at section B) / Symptom: / Operation of indoor unit No. 1 and indoor unit No. 3 is possible / However, if operation is then started in this condition, the combination of the 28BB outdoor unit and the 14BB indoor unit (master unit) will cause abnormal operation of indoor unit No. 2 to occur / ↓ / If operation continues, an abnormality will occur on the refrigeration cycle and operation will stop

- **Remote control . . . “CHECK” flashes (indoor unit No. 2 abnormality)**
- **Indoor unit No. 2 . . . LED2 on the printed circuit board flashes (both master and slave units)**
- **Outdoor unit No. 2 . . . The LEDs on the printed circuit board flash /**

3. The main power is turned on while the remote control connection cord is not connected (open circuit at section C) / Symptom: / Nothing abnormal appears on the remote control display, and operation of indoor unit. No. 1 and indoor unit No. 2 is possible. / However, indoor unit No. 3 cannot be operated. /

Remedy

1. Turn off the main power. / ↓
2. Connect the disconnected wires correctly. / ↓
3. Turn the main power back on. / ↓
4. After 1 minute, start operation using the remote control. / (Indoor

units . . . Operation will start according to the remote control setting.) / (Outdoor units . . . Operation will start after 3-5 minutes.) /

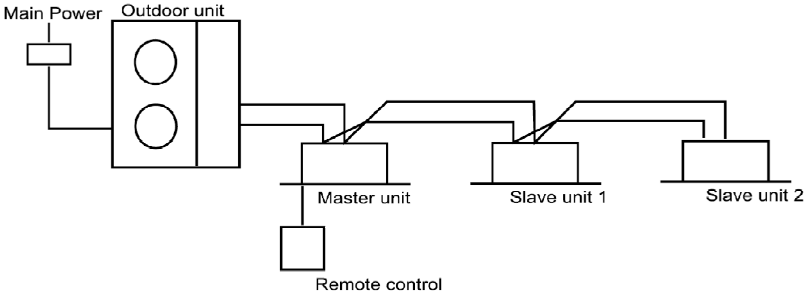
If slave units do not operate even after the wiring has been corrected (automatic addressing is not possible)

1. **Check that DIP switches 1 to 4 and DIP switch 8 are all set to OFF, and then stop operation. /** ↓
2. **Press the “AIRSWING AUTO”, “OPERATION” and “A/C No.” buttons simultaneously. / The addresses will be momentarily reset, and then automatic address setting will be carried out once more.**

/ The above procedure cannot be used to carry out automatic address resetting of twin/triple control. / / (Note on automatic address setting) / The printed circuit boards automatically store the connected system configuration when power is supplied. As a result, once the power has been turned on for these printed circuit boards, the units can not be changed about within the system, even if the units are of the same model and have same capacity. /

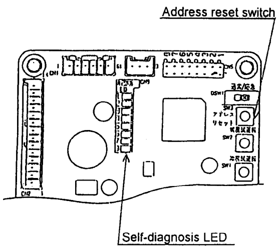
ADDRESS SETTING FOR TWIN/TRIPLE SYSTEM

(Example)



1. **Automatic address setting (no need to have dip-switch set) / If the wiring connected properly as above example, the address is set automatically by the main power supply. An indoor unit with remote control will be set as the master. If the power source is installed to indoor units and outdoor separately, turn on the switch as the following procedure: outdoor unit, indoor unit with control, and other indoor units. /**

   When the slave units do not operate (when address cannot be set) /

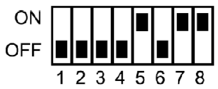
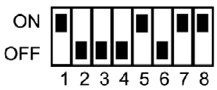

Address reset switch
Self-diagnosis LED

Reset the address as the following procedure:

1. **After making sure that dip-switch No. 1 to 4 and No. 8 are OFF, stop the operation.**
2. **Push address reset switch (SW3) on the outdoor unit PC board for 4 seconds. Self-diagnosis LED No. 2 to 8 will start blinking by order. And when all 7 pieces of LED (No. 2 ~ 8) are illuminated, address reset will be finished. Then the address for the slave unit will be reset.**

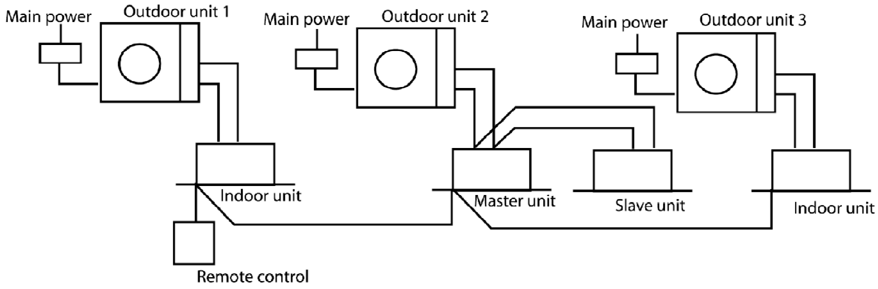
Important: The address for the group control cannot be reset, using the above mentioned procedure. /

2. **Manual address setting (by dip-switch DSW1) / When you set the address manually, set the dip-switch of the PC board in the indoor unit as follow:**

Master Unit	Slave unit (Slave No.1 of Triple)	Slave unit (Slave No.2 of Triple)
No need to set address for the RC of the master unit The address for the master unit will be set in the unit with RC	DSW1  No. 8 ON, the others no change	DSW1  No. 1 and 8 ON, the others no change

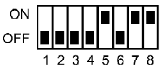
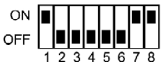
ADDRESS SETTING FOR GROUP CONTROL SYSTEM

(Example)

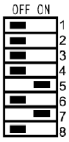
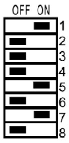
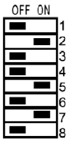
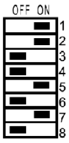
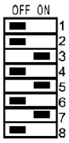
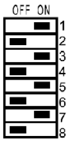
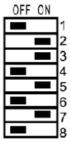
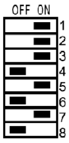
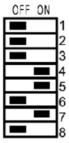
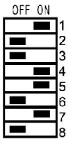
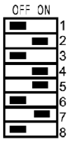
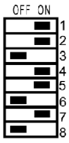
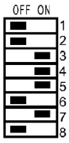
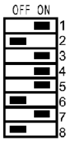
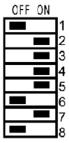
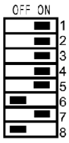

Main power
Outdoor unit 1
Main power
Outdoor unit 2
Main power
Outdoor unit 3
Indoor unit
Master unit
Slave unit
Indoor unit
Remote control

1. **Automatic address setting (no need to have dip-switch set) / If the wiring connected properly as above example, the AC numbers are set automatically by the main power supply. An indoor unit with remote control will be set as the master. / If the power source is installed to indoor units and outdoor separately, turn on the switch as the following procedure: outdoor unit, indoor unit with controller, and other indoor units. The AC number will be set at random. / /**

2. **Manual address setting (by dip-switch DSW1) / When you set the address manually, set the dip-switch of the PC board in the indoor unit as follow:**

Master Unit	Slave unit	
	Slave No.1 of Triple	Slave No.2 of Triple
No need to set address for the RC of the master unit The address for the master unit will be set in the unit with RC	DSW1  No. 8 ON, the others no change	DSW1  No. 1 and 8 ON, the others no change

3. Manual address setting (by dip-switch DSW1) / When you set the address manually, set the dip-switch of the PC board in the indoor unit as follow:

Indoor unit No.	1	2	3	4	5	6	7	8
Dip-switch on the PCB of the Indoor unit (DSW1)	 No Change	 No.1 ON	 No.2 ON	 No.1,2 ON	 No.3 ON	 No.1, 3 ON	 No.2, 3 ON	 No.1, 2, 3 ON
Indoor unit No.	9	10	11	12	13	14	15	16
Dip-switch on the PCB of the Indoor unit (DSW1)	 No. 4 ON	 No.1, 4 ON	 No.2, 4 ON	 No.1,2, 4 ON	 No.3, 4 ON	 No.1, 3, 4 ON	 No.2, 3, 4 ON	 No.1, 2, 3, 4 ON

Procedures of deleting memory at twin/triple control system

1. **Set the “OFF” position for main power supply switch.**
2. **Set the “ON” position for No. 8 pin of dip switch (DSW1) on indoor unit P.C. board.**
3. **Take main power supply switch “ON” for one minute, and then main power supply switch off.**
4. **Set the “OFF” position for No. 8 pin of dip switch (DSW1).**

Procedure of deleting memory at group control system

1. **Set the “OFF” position for main power supply switch.**
2. **Set the “ON” position for No. 1 pin to No. 4 pin of dip switch (DSW1) on indoor unit P.C. board. / (No. 8 pin of dip switch (DSW1) should be “OFF” position)**
3. **Take main power supply switch “ON” for one minute, and then**

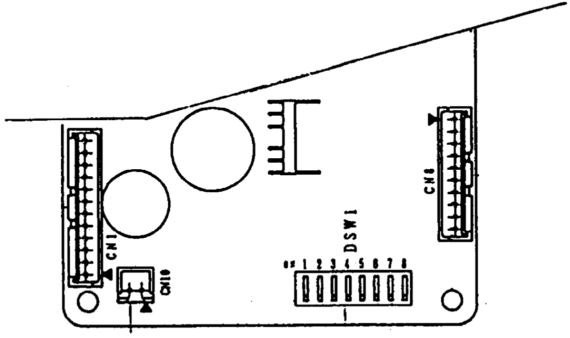
main power supply switch off.

4. Set the "OFF" position for No. 1, No. 2, No. 3 and No. 4 pin of dip switch (DSW1).

(Important notice) / Above procedures are for deleting memory on indoor unit P.C. board. And it is not for Address reset.

21.1. Indoor unit P.C. board layout.

Below drawing has showing the location of dip switch 1(DSW1) on the indoor unit P.C. board.



Dip switch1(DSW1). [to use for manual setting]

22. EMERGENCY OPERATION

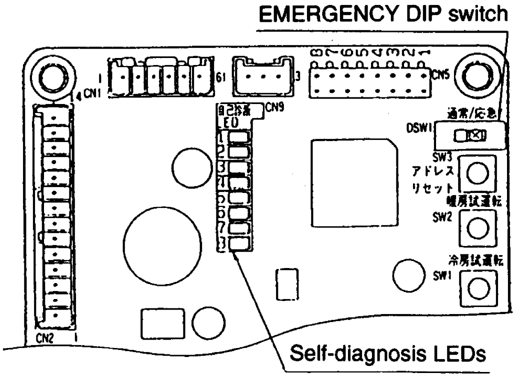
Emergency operation

- **Emergency operation of outdoor unit / Emergency operation can be carried out by setting the DSW1 switch on the printed circuit board inside the outdoor unit to the EMERGENCY position. However, emergency operation is only carried out when an abnormality is detected by the indoor/outdoor temperature thermistors. / The resistance values of each thermistor are measured as shown in the table below to determine if there is an abnormality. / / Thermistor resistance table**

Temperature	Resistance value (k Ω) ± 5%	
	Room temperature thermistor	Pipe temperature thermistor
-20°C	205.8	197.8
-10°C	114.6	111.9
-5°C	87.3	85.4
0°C	67.0	65.8
5°C	51.8	51.0
10°C	40.4	39.9
15°C	31.7	30.7
20°C	25.1	25.0
25°C	20.0	20.0
30°C	16.1	16.0
40°C	10.4	10.6
50°C	6.9	7.1
60°C	4.7	4.9
70°C	___	3.5
80°C	___	2.5
90°C	___	1.8
100°C	___	1.4

The pipe temperature thermistor resistance value are the same for the indoor and outdoor units.

<When a thermistor abnormality is judged to have occurred>


EMERGENCY DIP switch
CN1
CN9
CN5
CN2
自己診断 LED
通常/応急
DSW1
SW3
アドレス リセット
暖房試運転
SW2
冷房試運転
SW1
Self-diagnosis LEDs

- Set only the thermistor which shows an abnormality to the condition shown in the table below to carry out emergency operation

	Thermistor	Cooling mode	Heating mode
Indoor unit	**Room temperature**	**Fixed at 25°C**	
	Room temperature	**Shorted**	**Open**

	Thermistor	Cooling mode	Heating mode
Outdoor unit	**Discharge temperature**	**Open**	**Shorted**
	Heat exchanger outlet temperature	**Shorted**	**Open**

- Refer to the circuit diagram for the connection locations for each thermistor.

- If there is an abnormality in the room temperature thermistor, the temperature will be fixed at 25°C regardless of the remote control unit display.

NOTE:

- Any abnormalities detected by the temperature thermistors are ignored during emergency operation, so that long-term operation in this mode should be avoided.

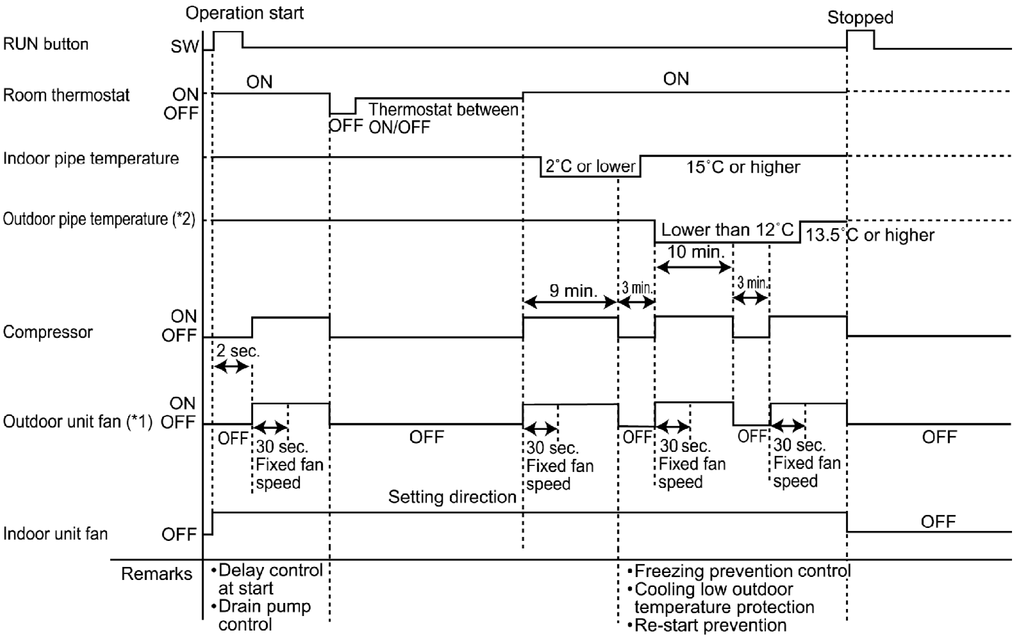
- After emergency mode operation has been completed and normal operation is to be resumed, turn the power supplies for the indoor and outdoor units off and return the DIP switch to the NORMAL position.

- Self-diagnosis LEDS 4 to 6 will flash during emergency operation.

23. CONTROL

23.1. Description of basic Functions

23.1.1. Cooling mode operation time chart


Operation start
Stopped
RUN button
SW
Room thermostat
ON
OFF
ON
Thermostat between
OFF ON/OFF
ON
Indoor pipe temperature
2˚C or lower
15˚C or higher
Outdoor pipe temperature (*2)
Lower than 12˚C
13.5˚C or higher
10 min.
9 min.
3 min.
3 min.
Compressor
ON
OFF
2 sec.
Outdoor unit fan (*1)
ON
OFF
OFF
30 sec.
Fixed fan
speed
OFF
Setting direction
30 sec.
Fixed fan
speed
OFF
30 sec.
Fixed fan
speed
OFF
30 sec.
Fixed fan
speed
OFF
Indoor unit fan
OFF
OFF
Remarks
•Delay control
at start
•Drain pump
control
•Freezing prevention control
•Cooling low outdoor
temperature protection
•Re-start prevention

(*1) / Outdoor unit fan start control during cooling / At the start of cooling mode and drying mode operation, the outdoor unit heat exchanger outlet temperature is detected in order to set the fan speed. / Operation is carried out at the fan speed detected for 30 seconds.

Heat exchanger outlet temperature detected (T)	Outdoor unit fan start speed
T < 0°C	SUPER LOW
0°C ≦ T < 10°C	LOW
10°C ≦ T < 20°C	MEDIUM
20°C ≦ T < 25°C	HIGH
25°C ≦ T	SUPER HIGH

After 30 seconds, the heat exchanger outlet temperature is detected and the outdoor unit fan speed is changed automatically.

(*2) / Cooling low outdoor temperature protection / When the heat exchanger outlet temperature drops to less than 12°C for a continuous period of 10 minutes, the outdoor unit stops running. / This is cancelled after 3 minutes (re-start prevention)

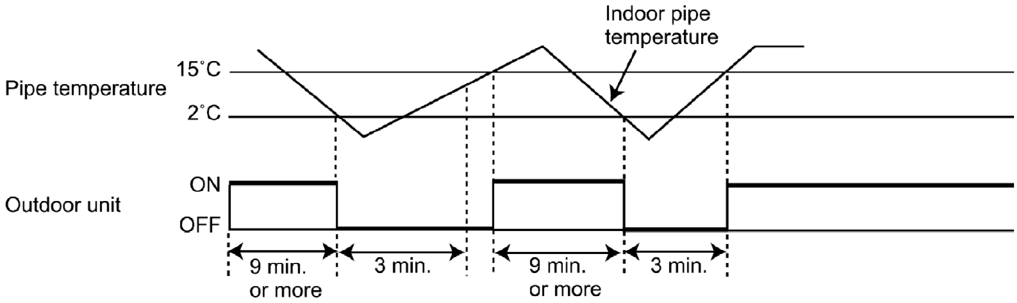
- **Remote control displays and indoor unit operation continue during this time.**
- **The 10-minute countdown is cleared if the compressor stops or if the temperature at the outdoor unit outlet rises to 13.5°C or higher.**

23.2. Freezing prevention control

1. Operation / During cooling mode operation, after 9 minutes have passed since the compressor turned on, the outdoor units stops operating when the temperature detected by the indoor unit pipe temperature sensor is 2°C or lower. / The indoor unit continues

operating at the fan speed set by the remote control unit. (The remote control unit display does not change.)

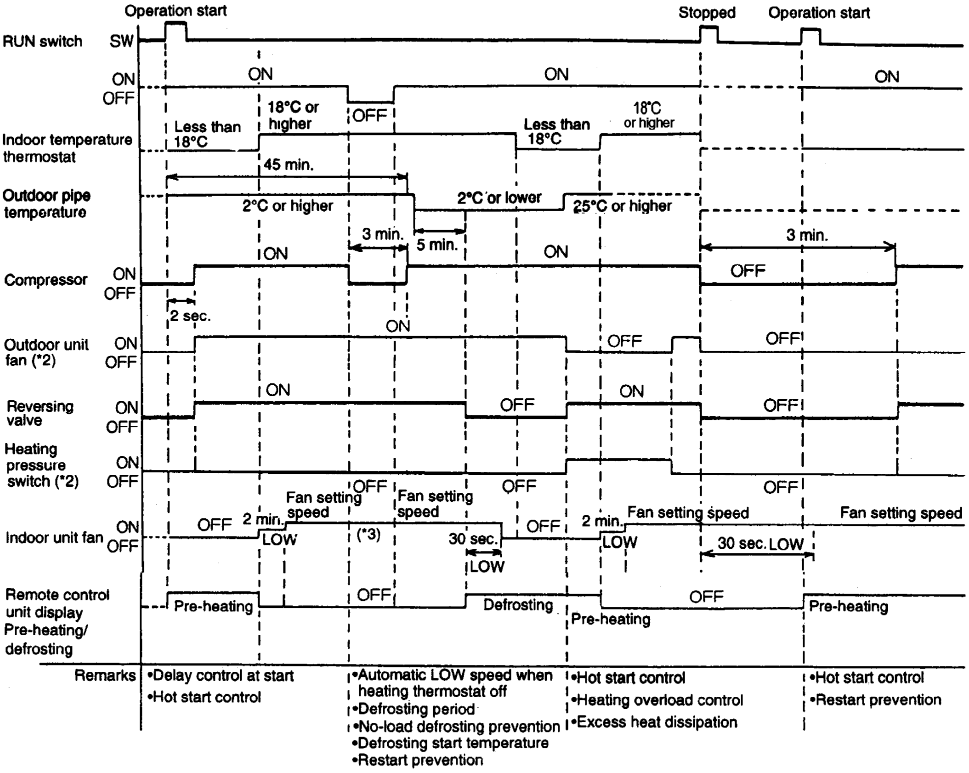
2. **Cancelling / This control is cancelled when the temperature detected by the indoor unit pipe temperature sensor is 15°C or higher. / (If the outdoor unit stops even though the temperature is 15°C or higher, restart prevention control will activated and the outdoor unit will not start again for 3 minutes.) / (The 9-minute countdown is cleared while the compressor is stopped.)**



Indoor pipe temperature
Pipe temperature
15˚C
2˚C
Outdoor unit
ON
OFF
9 min. or more
3 min.
9 min. or more
3 min.

(The above illustration shows the operation when there are no conditions for turning the outdoor unit off other than freezing prevention.)

23.3. Heating mode operation time chart (Heat pump type only)


Operation start
Stopped
Operation start
RUN switch
SW
ON
OFF
Indoor temperature thermostat
Less than 18°C
18°C or higher
OFF
Less than 18°C
18°C or higher
45 min.
Outdoor pipe temperature
2°C or higher
2°C or lower
25°C or higher
3 min.
5 min.
3 min.
Compressor
ON
OFF
2 sec.
Outdoor unit fan (*2)
Reversing valve
Heating pressure switch (*2)
Indoor unit fan
Fan setting speed
2 min.
LOW
(*3)
30 sec.
30 sec. LOW
Remote control unit display Pre-heating/ defrosting
Pre-heating
Defrosting
Remarks
•Delay control at start
•Hot start control
•Automatic LOW speed when heating thermostat off
•Defrosting period
•No-load defrosting prevention
•Defrosting start temperature
•Restart prevention
•Hot start control
•Heating overload control
•Excess heat dissipation
•Hot start control
•Restart prevention

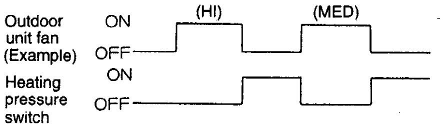
(*3) Refer to "6 Indoor unit fan control when thermostat is off during heating mode operation"

(*4) Refer to "9 Indoor thermostat characteristics

(*2) / Outdoor unit fan control during heating mode operation

Under conditions when the compressor is on during heating mode operation (except during defrosting and / when the liquid bypass valve is on), the outdoor unit fan is controlled by means of input (CN2) indicating / whether the contact of the heating pressure switch on the outdoor unit circuit board is open or closed / (At the start of heating mode operation, the fan operates at HI speed.)

Heating pressure switch contact	Outdoor unit fan operation
ON (open) - OFF (closed)	One step down from fan speed before stopping
ON (open)	Stopped


Outdoor unit fan (Example)
ON
OFF
(HI)
(MED)
Heating pressure switch
ON
OFF

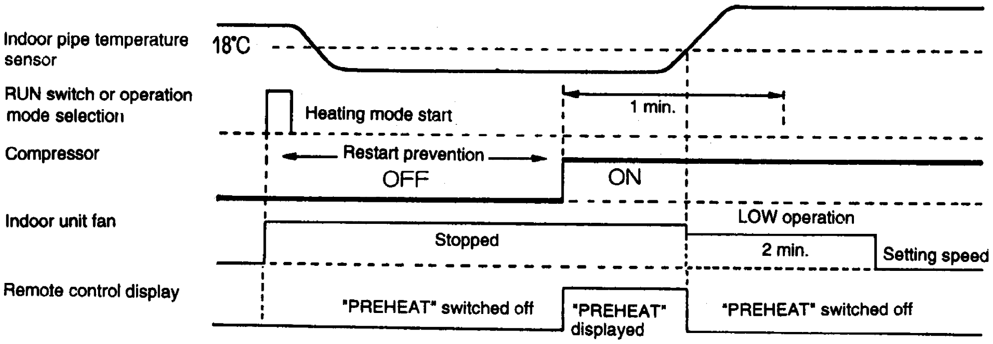
The heating pressure switch turns on at 2.35 MPa and off at 1.96 MPa.

23.4. Hot starting

1. When heating mode operation starts

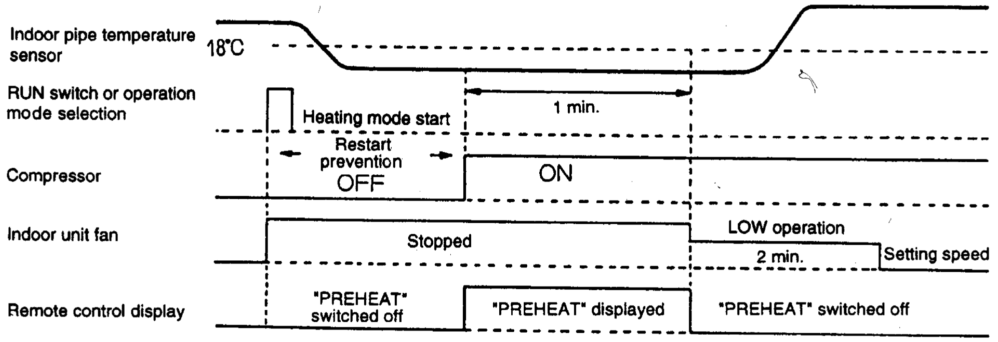
1. **Start / Hot start control commences heating mode operation starts.**
2. **Operation / “PREHEAT” appears on the remote control display. (Other displays remain unchanged.) / At the indoor unit, the indoor unit fan stops. In addition, during hot starting, the louvre stays at the horizontal / position (angle 0~).**

3. **Cancelling / After 1 minute has passed since heating mode operation started, or if the compressor has turned on, hot / starting is cancelled when the temperature detected by the indoor unit pipe temperature sensor is 18~C / or higher. / After cancellation, the "PREHEAT" display on the remote control disappears and the louvre operation / returns to the previous setting. / (However, for 2 minutes after cancellation, the indoor unit fan operates at LOW speed, and then returns to / the previous setting.) / / <When hot start operation is cancelled by temperature>**



Indoor pipe temperature sensor
18°C
RUN switch or operation mode selection
Heating mode start
1 min.
Compressor
Restart prevention
OFF
ON
Indoor unit fan
Stopped
LOW operation
2 min.
Setting speed
Remote control display
"PREHEAT" switched off
"PREHEAT" displayed
"PREHEAT" switched off

<When hot start operation is cancelled by time>

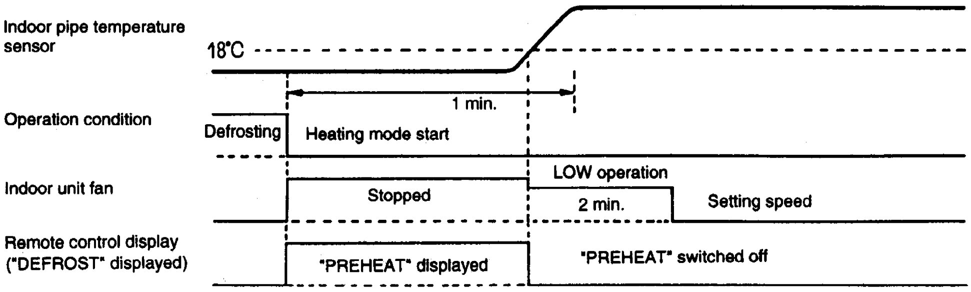


Indoor pipe temperature sensor
18°C
RUN switch or operation mode selection
Heating mode start
1 min.
Restart prevention
Compressor
OFF
ON
Indoor unit fan
Stopped
LOW operation
2 min.
Setting speed
Remote control display
"PREHEAT" switched off
"PREHEAT" displayed
"PREHEAT" switched off

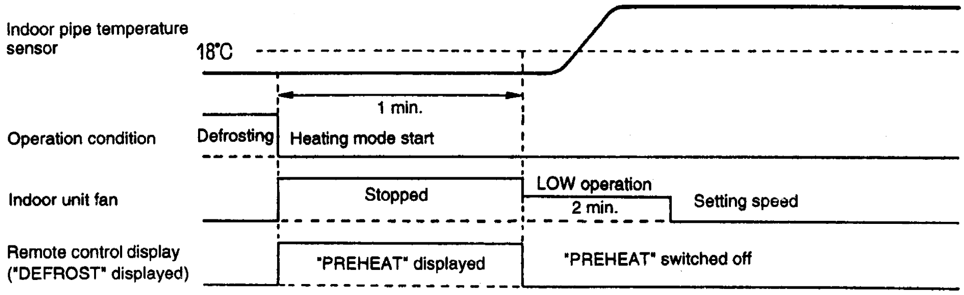
2. When defrosting is complete

1. **Start / Hot start control commences when defrosting is complete.**
2. **Operation / "PREHEAT" appears on the remote control display. (Other displays remain unchanged.) / At the indoor unit, the indoor unit fan stops. In addition, during hot starting, the louvre stays at the horizontal / position (angle 0~).**

3. **Cancelling / Hot starting is cancelled when the temperature detected by the indoor unit pipe temperature sensor is 18~C / or higher, or after a maximum 1 minute has passed since defrosting was completed. / After cancellation, the "PREHEAT" display on the remote control disappears and the louvre operation / returns to the previous setting. / (However, the indoor unit fan operates at LOW speed for 2 minutes after cancellation, and then returns to / the previous setting.) / < When hot start operation is cancelled by temperature >**

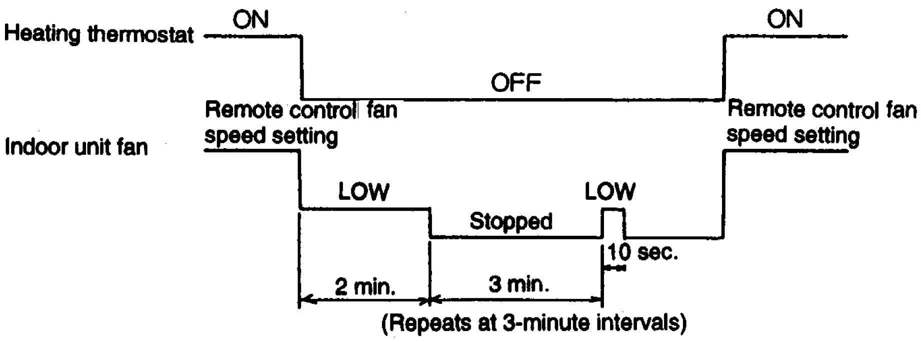

Indoor pipe temperature sensor
18°C
1 min.
Operation condition
Defrosting
Heating mode start
Indoor unit fan
LOW operation
Stopped
2 min.
Setting speed
Remote control display ("DEFROST" displayed)
"PREHEAT" displayed
"PREHEAT" switched off

<When hot start operation is cancelled by time>


Indoor pipe temperature sensor
18°C
1 min.
Operation condition
Defrosting
Heating mode start
Indoor unit fan
Stopped
LOW operation
2 min.
Setting speed
Remote control display ("DEFROST" displayed)
"PREHEAT" displayed
"PREHEAT" switched off

23.5. Indoor unit fan control when thermostat is off during heating mode operation

When the thermostat of the indoor unit turns off during heating mode operation, the indoor unit fan operates for 2 minutes at LOW and then stops. In addition, 5 minutes after the thermostat of the indoor unit turns off, the indoor unit fan again runs at LOW for 10 seconds, and at 3-minute intervals after that it switches back to LOW operation for 10 seconds.

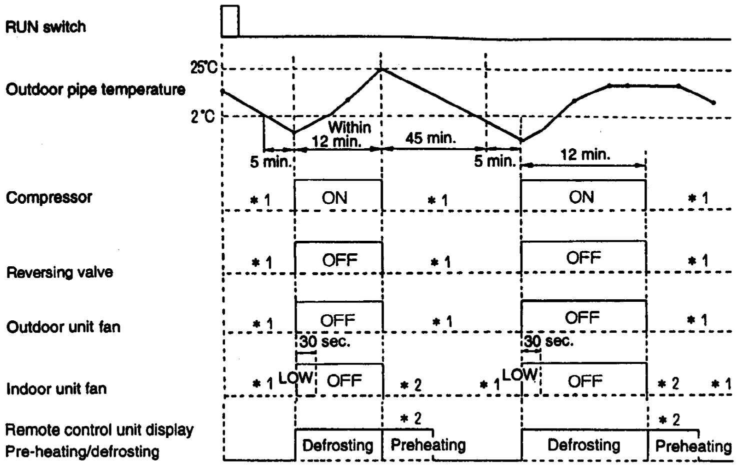

Heating thermostat
ON
OFF
ON
Indoor unit fan
Remote control fan speed setting
LOW
Stopped
LOW
Remote control fan speed setting
10 sec.
2 min.
3 min.
(Repeats at 3-minute intervals)

23.6. Excess heat dissipation for indoor unit

The indoor unit fan continues operating for 30 seconds after heating mode operation turns off in order to / dissipate excess heat.

1. **When heating mode operation has stopped / (LOW operation for 30 seconds)**
2. **When operation is set to a mode other than heating by means of the OPERATION MODE switch**
3. **If operation starts again during the 30 seconds mentioned in (1) above / (The fan operates at LOW speed for the remainder of the 30 seconds in (1), and then hot start commences.)**

23.7. Defrost mode operation time chart


RUN switch
25°C
Outdoor pipe temperature
2°C
Within 12 min.
45 min.
5 min.
5 min.
12 min.
Compressor
*1
ON
*1
ON
*1
Reversing valve
*1
OFF
*1
OFF
*1
Outdoor unit fan
*1
OFF
*1
OFF
*1
30 sec.
30 sec.
Indoor unit fan
*1
LOW
OFF
*2
*1
LOW
OFF
*2
*1
Remote control unit display
Pre-heating/defrosting
*2
*2
Defrosting
Preheating
Defrosting
Preheating

*1 indicates during normal operation.
*2 indicates during hot start control.

1. **Start and completion of defrosting**
   A. **Start / During heating mode operation (including automatic heating), after the 45-minute defrosting cycle time has / passed, defrosting starts if the temperature detected by the outdoor unit heat exchanger outlet sensor is / 2~C or lower for a continuous 5-minute period. / However, if the outdoor unit fan is stopped,**

the start of defrosting will be delayed by 5 minutes. / The defrosting cycle is 50 minutes from the start of heating mode operation.

B. Completion / Defrosting mode operation stops 12 minutes after it starts, or if the temperature detected by the outdoor / unit heat exchanger outlet sensor is 25~C or higher. / After defrosting is complete, hot starting commences.

C. Forced defrosting / If P8 on the outdoor unit circuit board is shorted while the compressor is ‘ON’ during heating mode operation / and the temperature detected by the outdoor unit heat exchanger outlet sensor is 25~C or lower, defrosting / is carried out regardless of the current starting conditions.

2. Operation

A. During defrosting, the outdoor unit turns on the compressor and turns off the outdoor unit fan and the reversing valve.

B. The indoor unit fan operates at LOW for 30 seconds after defrosting starts. After this, the indoor unit fan turns off until defrosting is complete. / (During defrosting, the louvre of the indoor unit stays at the horizontal.)

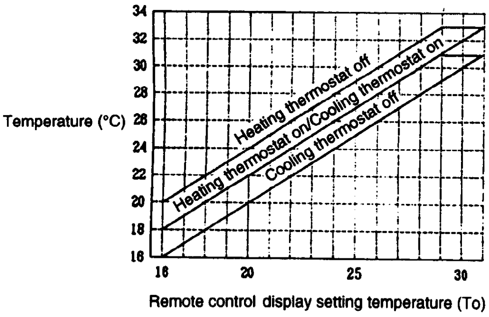
23.8. Indoor thermostat characteristic

1. Thermostat characteristic during cooling and heating modes

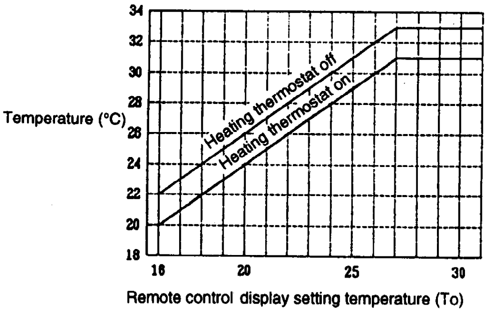
Operation mode	Setting temperature (To)	Room temperature (°C)		
		Operation	Differential	
			2.0K	4.0K
Cooling	16	ON	18.0	———
		OFF	16.0	———
	31	ON	33.0	———
		OFF	31.0	———
Heating *1	16	ON	18.0	20.0
		OFF	20.0	22.0
	29~31 *1(27~31)	ON	31.0	31.0
		OFF	33.0	33.0

*1 If jumper wire J3 on the indoor unit circuit board is disconnected, the thermostat characteristics during heating become 2 K or higher.

Thermostat characteristics during cooling and heating modes



Thermostat characteristics during heating mode (when jumper wire J3 is disconnected)



NOTE: If the remote control unit display setting temperature (To) is 29°C or higher, the heating thermostat turns on when the room temperature is 31°C.

2.Thermostat characteristics during dry mode

During dry mode operation, cooling mode operation is carried out in accordance with the indoor temperature as shown in the table below.

Mode	Indoor Temperature (°C) T	Operation details	
①	$T \geqq 28$	Cooling thermostat on	LO, Louvre horizontal
*②	$28 > T \geqq 25$	Cooling thermostat on 10 min./fan 5 min., alternate operation	LO, Louvre horizontal
*③	$25 > T \geqq 21$	Cooling thermostat on 5 min./fan 10 min., alternate operation	LO, Louvre horizontal
④	$21 \geqq T$	Cooling thermostat off	LO, Louvre horizontal

(Differential is 1.5 K)

*When modes ② and ③ are active, dry mode operation starts when the cooling thermostat turns on. When modes ② and ③ have been stopped, the 10 min./5 min. times have no relevance. However, if the indoor temperature is less than or equal to the remote control unit setting temperature, mode ④ is forcibly activated.

3.Thermostat characteristics during automatic changeover operation

①Settings at the start of automatic changeover operation

When operation starts, or when operation changes from some other mode to automatic changeover mode, it starts at the temperature characteristics given in the table below.

Indoor temperature (T) °C	Initial setting
T < remote control display temperature - 2 (°C)	Heating mode operation, thermostat on
Remote control display temperature ≧ T	Heating mode operation, thermostat off (fan mode operation)
Remote control display temperature ≦ T	Cooling mode operation, thermostat off (fan mode operation)
Remote control display temperature + 2 (°C) < T	Cooling mode operation, thermostat on

2 (°C): Thermostat differential

②Thermostat characteristics when switching between cooling and heating mode operation

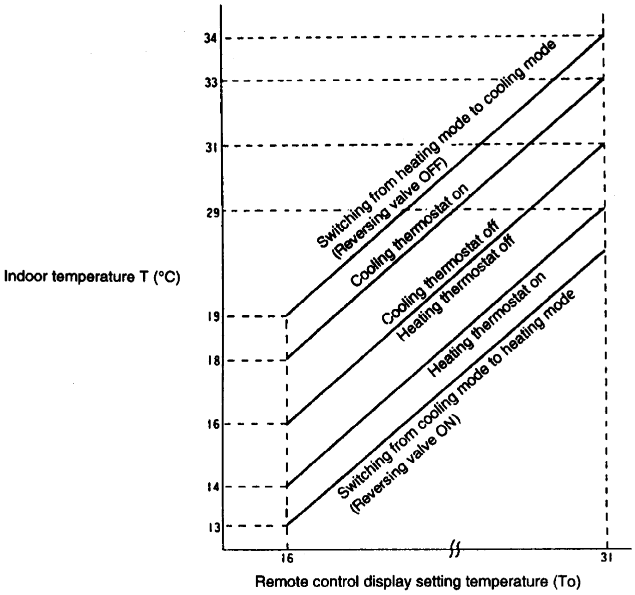
Switching between cooling mode and heating mode operation is carried out as shown in the table below. However, during automatic operation, the operation does not change again until 10 minutes after the thermostat has switched off in either cooling mode or heating mode.
(The 10-minute timer is cancelled when operation is changed to another mode or when operation stops and the thermostat turns on.)

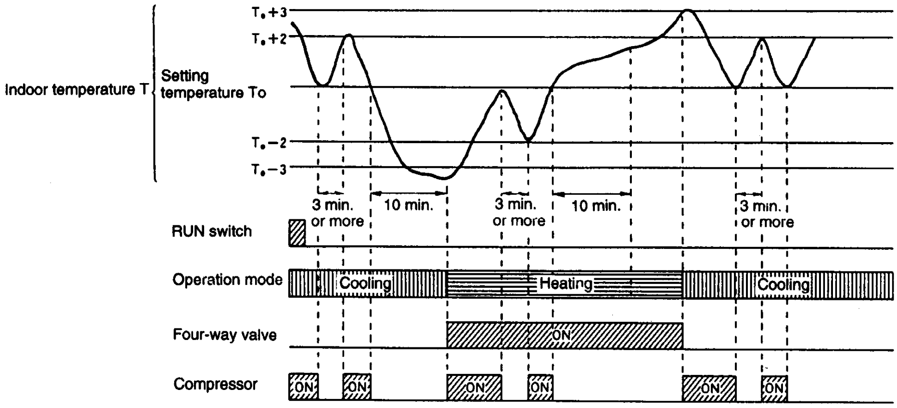
Indoor temperature (T) °C	Operation switching
T ≧ Remote control display temperature + 3 (°C)	Heating mode → Cooling mode
T ≦ Remote control display temperature - 3 (°C)	Cooling mode → Heating mode

4.Thermostat characteristic during cooling mode and heating mode operation. / The thermostat on/off characteristic in both operation modes are given in the table below.

Operation mode	Indoor temperature (T) °C	Operation
Cooling mode	T > Remote control unit display temperature + 2 (°C)	Cooling thermostat on
	T ≦ Remote control unit display temperature	Cooling thermostat off
Heating mode	T < Remote control unit display temperature - 2 (°C)	Heating thermostat on
	T ≧ Remote control unit display temperature	Heating thermostat off

Indoor temperature thermostat characteristics during automatic changeover operation





Automatic cooling/heating mode operation time chart

23.9. Indoor unit fan control

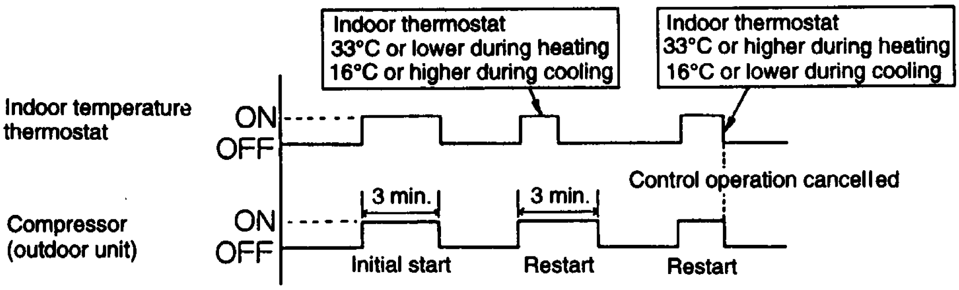
1. **Fixing at LO, MED or HI / When LO,MED or HI is set, the relay switches and operation is carried out at that setting.**
2. **Automatic fan speed / When set to AUTO, the indoor unit fan operation changes as shown in the table below.**

(Indoor temperature)–(Setting temperature) (Units: K)

	HI	MED	LO
Cooling mode	+ 3 or higher	+ 1.5 ~ 3	Less than + 1.5
Heating mode	- 3 or lower	- 1.6 ~ -3	More than -1.5
Fan mode	MED irrespective of temperature		

23.10. Forced operation during restart

The compressor will not stop operating for 3 minutes after cooling mode or heating mode operation starts, even if the indoor unit thermostat turns off. (However, the compressor will stop operating during this time if the indoor unit air intake temperature exceeds 33~C during heating mode operation or if the indoor unit air intake temperature drops below 16~C during cooling mode operation.)


Indoor thermostat
33°C or lower during heating
16°C or higher during cooling
Indoor thermostat
33°C or higher during heating
16°C or lower during cooling
Indoor temperature thermostat
ON
OFF
Control operation cancelled
3 min.
3 min.
Compressor (outdoor unit)
ON
OFF
Initial start
Restart
Restart

23.11. Outdoor unit fan excess heat dissipation control

1. **Start / Carried out when the compressor switches from on to off (when the remote control unit is used to stop operation)**
2. **Operation / The outdoor unit fan runs at SUPER HI speed for approximately 60 seconds and then stops.**

23.12. Discharge temperature control

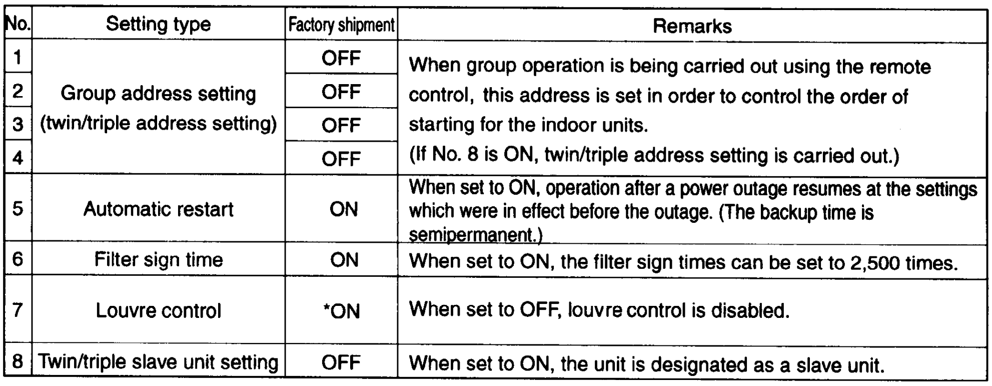
1. **Operation / When the discharge temperature sensor detects a temperature of 100~C or higher during cooling mode operation, the liquid bypass valve is turned on.**
2. **Cancelling / When the discharge temperature sensor detects a temperature of 70~C or lower, the liquid bypass valve is turned off.**

23.13. Emergency operation

When the emergency operation switch (DSW1) on the outdoor unit printed circuit board is set to the emergency setting, then emergency operation is enabled. This allows normal operation to continue, with all abnormalities other than a discharge temperature abnormality, high pressure abnormality or overcurrent abnormality being ignored.

23.14. DIP switch settings

- **Indoor unit printed circuit board (DSW1)**



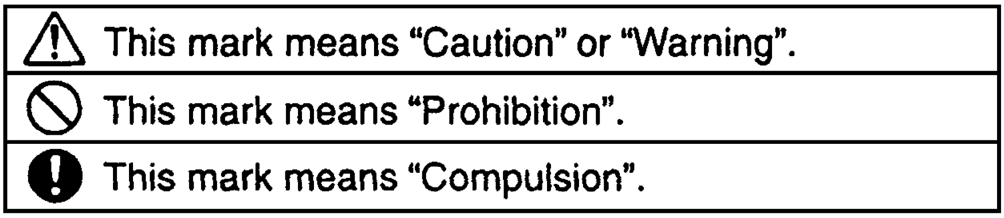
No.	Setting type	Factory shipment	Remarks
1	Group address setting (twin/triple address setting)	OFF	When group operation is being carried out using the remote control, this address is set in order to control the order of starting for the indoor units. (If No. 8 is ON, twin/triple address setting is carried out.)
2		OFF	
3		OFF	
4		OFF	
5	Automatic restart	ON	When set to ON, operation after a power outage resumes at the settings which were in effect before the outage. (The backup time is semipermanent.)
6	Filter sign time	ON	When set to ON, the filter sign times can be set to 2,500 times.
7	Louvre control	*ON	When set to OFF, louvre control is disabled.
8	Twin/triple slave unit setting	OFF	When set to ON, the unit is designated as a slave unit.

24. INSTALLATION <INDOOR UNIT>

24.1. Precautions in terms of safety

Carry out the installation work with reliability after thorough reading of this "Precautions in te safety".

- **Precautions shown here are differentiated between ⚠ Warning and ⚠ Cautions, those that have a high chance of leading to a significant result such as fatality or serious injury if the wrong installation is carried our are listed in the ⚠ Warnings. / However, even in the case of items which are listed in the column ⚠ Cautions, column such items also offer a chance of leading to a significant result depending on the situations. / In either case, important descriptions regarding the safety are listed, then observe them without fail.**
- **Description of illustration**



⚠	This mark means “Caution” or “Warning”.
⊘	This mark means “Prohibition”.
❗	This mark means “Compulsion”.

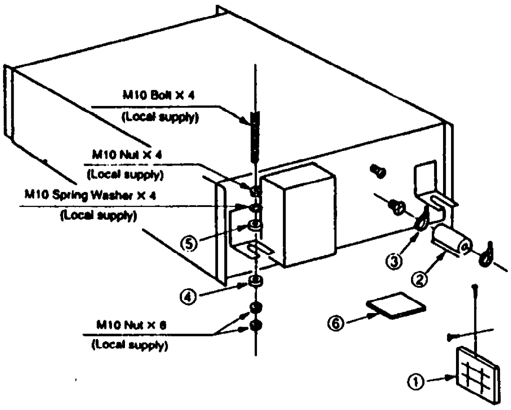
- **After installation work has been completed, do not only make sure**

that the unit is free from any abnormal condition through the execution of dry but also explain how to use and how to perform maintenance of this unit to the customer according to the instruction manual. / In addition, request the customer to keep this manual for installation work together with instruction manual.

⚠ Warnings	⚠ Cautions
▲ As to installation, request the distributor or vendor to perform it. Imperfection in installation caused by that having been carried out by the customer himself leads to water leakage, electric shock, fire, etc.	▲ Carry out ground work.Do not connect the ground return to the gas pipe, water line pipe, lightning rod, ground return of the telephone.Imperfection in ground return may lead to electric shock.
▲ Carry out the installation work with reliability according to this manual for installation work. Imperfection in installation leads to water leakage, electric shock, fire, etc.	▲ Do not install the unit at the place where the possibility of inflammable gas leakage exists. If such gas leakage should arise and the gas builds up around the unit, such situation may lead to ignition.
▲ Carry out the installation with reliability on the place that bears the weight of this unit sufficiently. Insufficient strength leads to injury due to falling of the unit.	▲ Mounting of the earth leakage breaker is required. Omission in mounting of the earth leakage breaker may lead to electric shock.
▲ Carry out predetermined installation work in preparation for strong wind such as typhoon, earthquake. Imperfection in installation work may lead to accident arisen from overturn, etc.	▲ Drain piping should be made to ensure secure drainage according to the manual for installation work and carry out the thermal insulation to prevent the occurrence of condensation. Imperfection in piping work leads to water leakage and may cause the house and property, etc. to become wet.
▲ Electric work shall be carried out by the person qualification as an electric worker according to "Technical standards regarding electric installation", and manual for installation work, and use exclusive circuit without fail. Presence of insufficient capacity in power circuit or imperfection in execution leads to electric shock, fire, etc.	
▲ Wiring shall be connected securely using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section. Imperfect connection and fixing leads to fire, etc.	

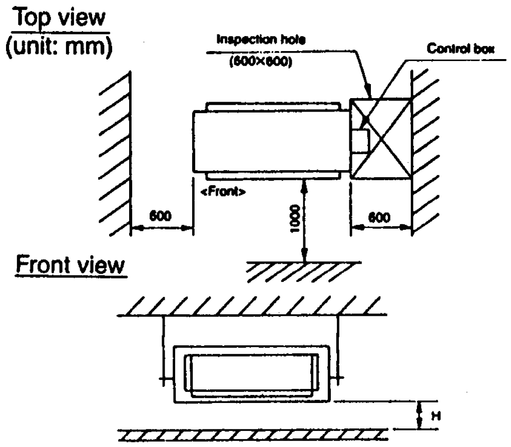
24.2. ACCESSORIES PACKED IN THE INDOOR UNIT CONTAINER

No.	Parts name	Q'ty
1	Remote control box	1
	Plastic cord retainer	4
	Ø 4 Tapping screw	2
	M4 Screw	2
	Ø 3 Tapping screw	4
2	Thermal insulator for refrigerant pipe	1
3	Hose clip for thermal insulator	2
4	M10 Flange washer	4
5	M10 Flat washer	4
6	Thermal insulator for drainage hole	1


M10 Bolt X 4
(Local supply)
M10 Nut X 4
(Local supply)
M10 Spring Washer X 4
(Local supply)
⑤
④
M10 Nut X 8
(Local supply)
③
②
⑥
①

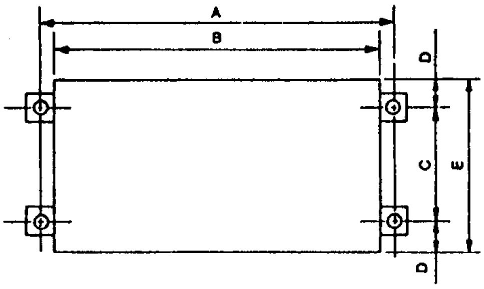
24.3. SELECTING THE LOCATION OF THE INDOOR UNIT

- The place shall easily bear a load exceeding four times the indoor units weight.
- The place shall be able to inspect the unit as the figure.
- The place where the unit shall be levelled.
- The place shall allow easy water drainage. / (Suitable dimension "H" is necessary to get slope to drain as figure.)
- The place shall easily connect with the outdoor unit.
- The place where the unit is not affected by an electrical noise.


Top view
(unit: mm)
Inspection hole
(600×600)
Control box
<Front>
600
1000
600
Front view
H

24.4. INSTALLATION OF INDOOR UNIT

[POSITION OF SUSPENSION BOLT]



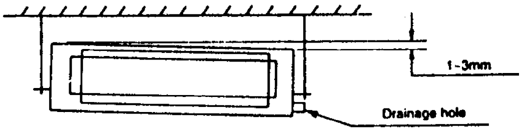
(unit: mm)

Model name	A	B	C	D	E
CS-A24BD1P	1,060	1,000	330	35	400
CS-A28BD1P					
CS-A34BD1P	1,060	1,000	540	55	560
CS-A43BD1P					
CS-A50BD1P					

- Apply a joint-canvas between the unit and duct to absorb unnecessary vibration.

- Apply a filter (local supply) at air return hole.

⚠ Install the unit leaning to a drainage hole side as a figure for easy water drainage.

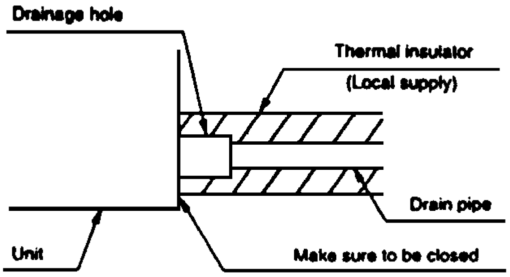

1-3mm
Drainage hole

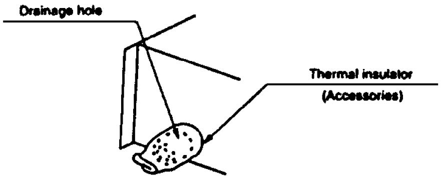
24.5. INDOOR UNIT DRAIN PIPING

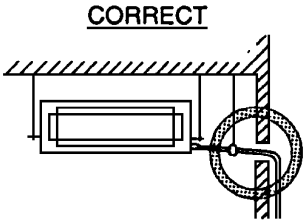
- The unit has two drainage holes at both side.
The drainage hole without connection needs seal and thermal insulation with accessories.

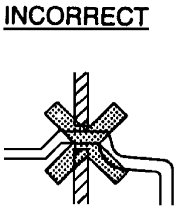
Always lay the drain with downward inclination (1/50 to 1/100).
Prevent any upward flow or reverse flow in any part.

- 5mm or thicker formed thermal insulator shall always be provided for the drain pipe.


Drainage hole
Thermal insulator
(Local supply)
Drain pipe
Unit
Make sure to be closed


Drainage hole
Thermal insulator
(Accessories)



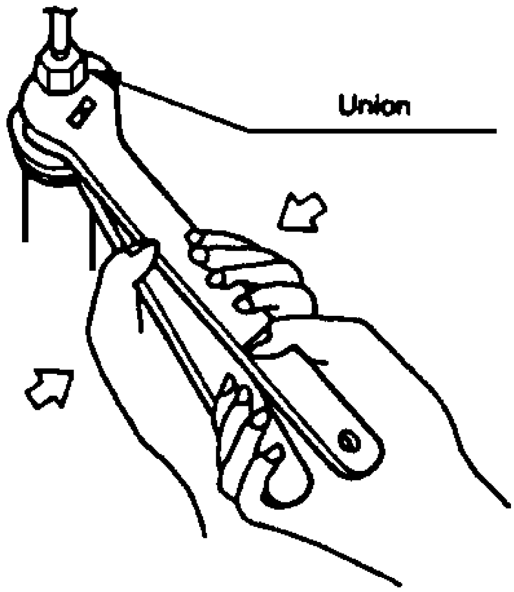


24.6. PIPING CONNECTION

1. **Form the piping according to its routing. Avoid bending and bending back the same piping point more than three times. (This will result in hardening the pipe.)**
2. **After deforming the piping, align centres of the union fitting of the**

indoor unit and the piping, and tighten them firmly with renches.

3. **Connect pipe to the service valve or ball valve which is located below the outdoor unit.**
4. **After completing the piping connection, be sure to check if there is gas leakage in indoor and outdoor connection.**



Model name	Liquid side piping	Gas side piping
CS-A24BD1P CS-A28BD1P	Ø 9.52mm	Ø 15.88mm
CS-A34-BD1P	Ø 9.52mm	Ø 19.05mm
CS-A43BD1P CS-A50BD1P	Ø 12.7mm	Ø 19.05mm

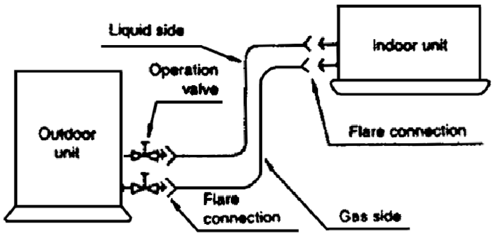
/ Vacuum drying

After completing te piping connection, execute vacuum drying forthe connection piping and the indoor unit.The vacuum drying must be carried out using the service ports ofboth liquid and side valves.

CAUTION

Use two wrenches and tighten with regular torque.

Flare nut fastening torque N-m (kgf.cm)			
Ø 6.35	**12.7 - 16.7 (130 - 170)**	**Ø 15.88**	**39.2 - 44.1 (400 - 450)**
Ø 9.52	**22.6 - 26.5 (230 - 270)**	**Ø 19.05**	**49.0 - 53.9 (500 - 550)**
Ø 12.7	**32.4 - 36.3 (330 - 370)**		



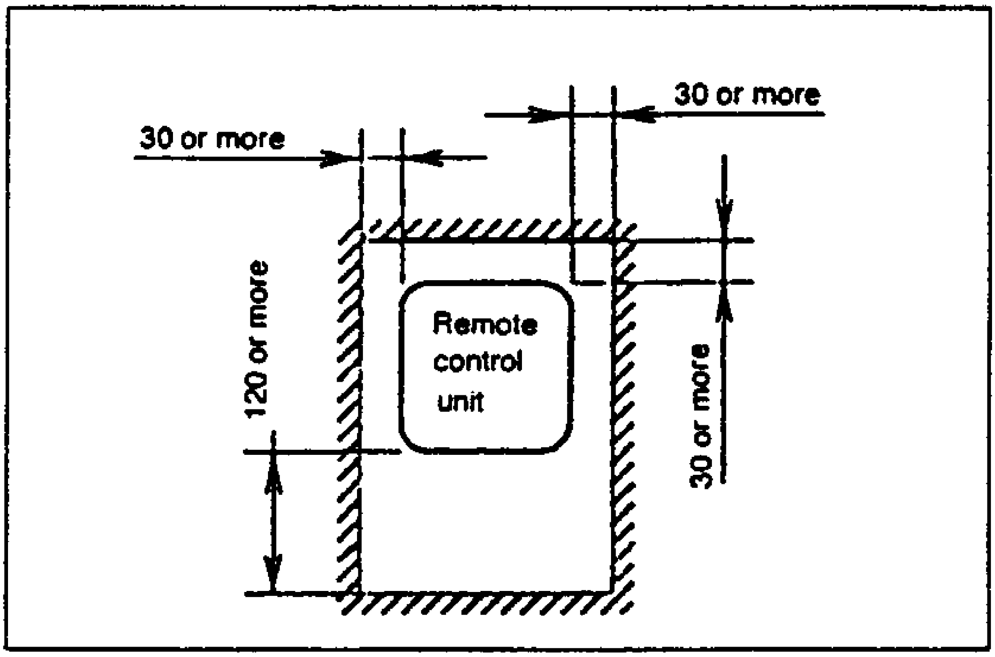
24.7. POINT OF REMOTE CONTROL INSTALLATION

24.7.1. Notes regarding wired remote control unit setting-up location

- **Select a place where the remote control unit can be operated easily (after obtaining approval from the building's owner).**
- **Install in a place which is away from direct sunlight and as free from humidity as possible.**
- **Install in a place which is as flat as possible to avoid warping of the remote control unit. (If installed to a wall with an uneven surface, damage to the LCD case or operation problems may result.)**
- **Install in a place where the LCD can be seen easily. If the remote control unit is installed somewhere which is too low or too high, it may be difficult to read the LCD. (Standard height from the floor is 1.2 to 1.5 metres.)**
- **Avoid installing the remote control cord near refrigerant pipes or drain pipes.**
- **Install the remote control cord at least 5 cm away from other electric wires (including stereo and TV cables) to avoid mis-operation (electromagnetic noise).**
- **If passing the remote control cord through a wall, be sure to install a water trap above the cord.**
- **For twin and triple types, only the main unit can be connected to**

the remote control unit. (The indoor unit connected to the remote control unit becomes the main unit, and connection is not possible to the sub units.)

- Allow sufficient space around the remote control unit as shown in the illustration at right. Secure the remote control unit lower case to the wall or to an outlet.



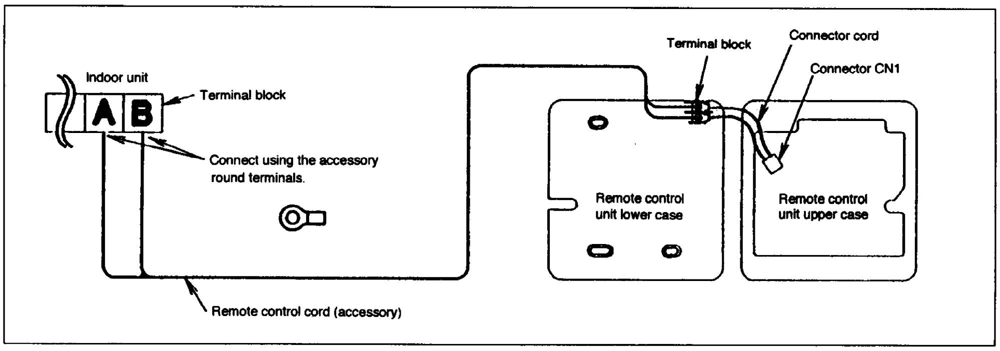
24.7.2. Remote control unit installation

- Be sure to turn off the main power before installing and connecting the remote control unit. / (If the remote control unit is connected while the power is still turned on, the remote control unit displays may not appear.) / If no displays appear on the remote control unit, check while referring to "If no remote control unitdisplays appear" in "5. Test operation".
- The remote control cable is live during use, so take care not to short it. / /

Remote control unit wiring

- Connect the indoor unit and the remote control unit as shown in the illustration below.
- The remote control unit cord is non-polar.
- At the time of shipment from the factory, the connector cable used to connect the terminal block and / connector CN1 is

disconnected. When connecting the remote control unit wiring and installing / the remote control unit, be sure to connect the cord to connector CN1. / /


Indoor unit
Terminal block
A
B
Connect using the accessory round terminals.
Remote control cord (accessory)
Terminal block
Connector cord
Connector CN1
Remote control unit lower case
Remote control unit upper case

Extending the remote control cord

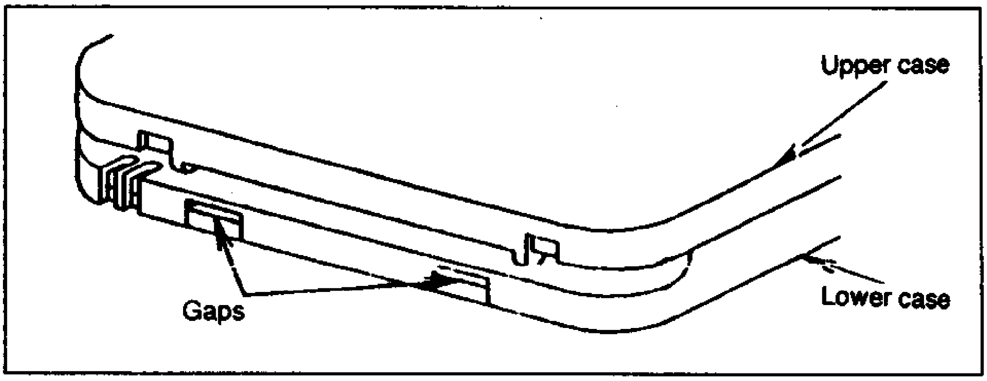
- **Solder a sheathed PVC cord or cable (0.5 - 2.0 mm_2) with specifications among those given below to the remote control unit end of the accessory remote control cord (10m).**
- **PVC round cabtire cord**
- **PVC-insulated PVC sheathed cable for control use**
- **PVC-insulated PVC sheathed cable for control use**
- **600 V PVC-insulated PVC sheathed round cable**
- **600 V PVC-insulated PVC sheathed flat cable**
- **600 V PVC-insulated PVC cabtire cable**

NOTE

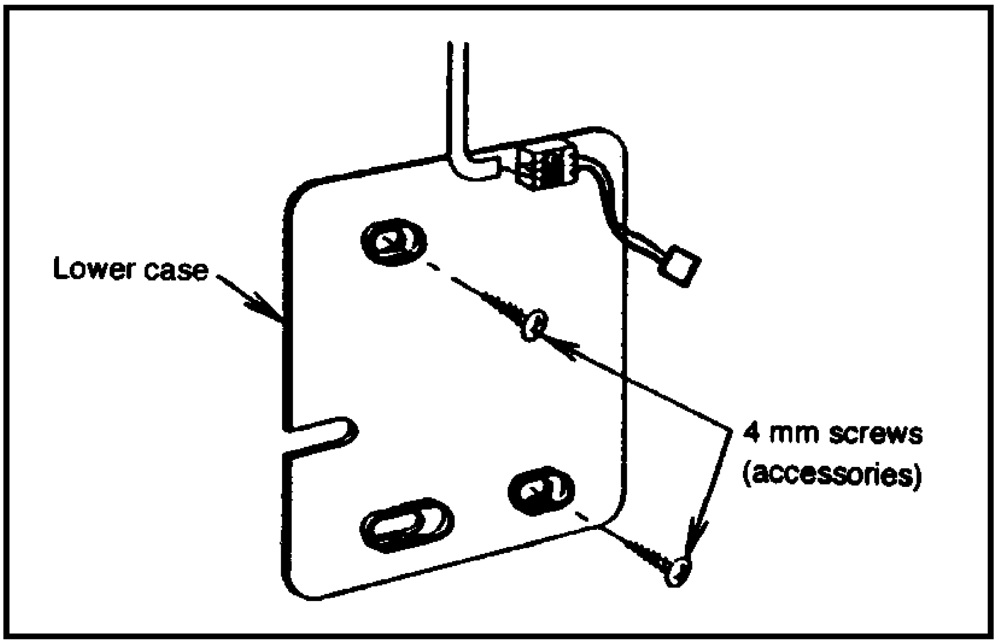
The maximum possible length for the remote control cord is 200 metres.

Remote control unit installation procedure

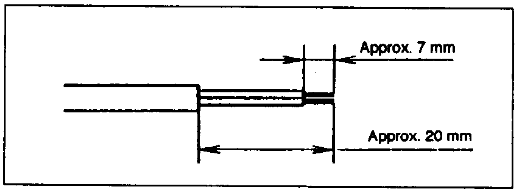
- **Remove the remote control unit lower case. / (Insert a flat-tipped screwdriver or similar 2 to 3 mm into one of / the gaps at the bottom of the case, and then twist the screwdriver / to open. [Refer to the illustration at right.]) / Be careful not to damage the lower case.**
- **Secure the lower case to the wall or outlet box. / (Refer to the illustration at right for the embedded and exposed / positions for the remote control cord.)**


Upper case
Gaps
Lower case

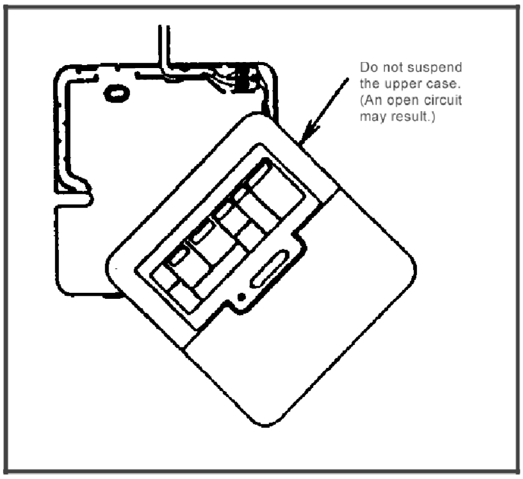
NOTE / ▲ Be sure to use only the accessory screws. / ▲ Do not bend the lower case when tightening the screws. (If the screws are overtightened, damage may result.) / ▲ Do not remove the protective tape which is affixed to the upper case circuit board.


Lower case
4 mm screws
(accessories)

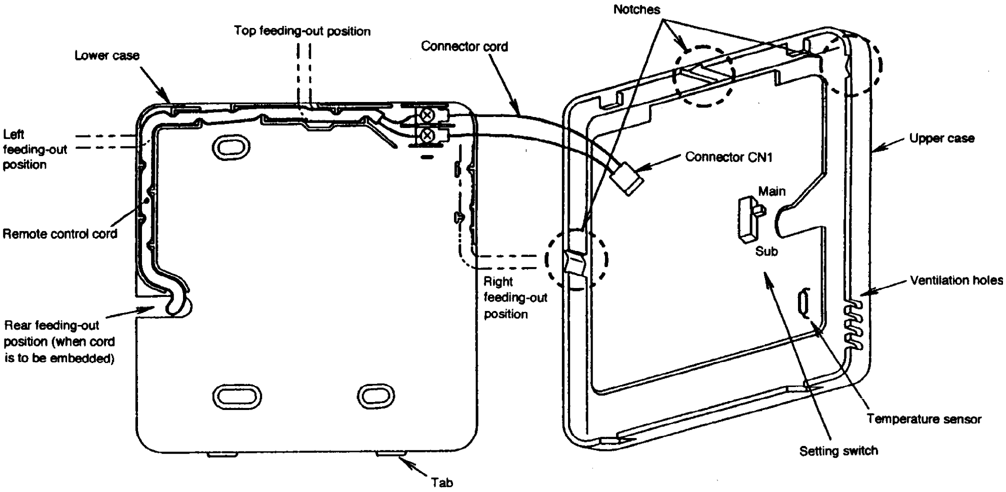
- **If installing the remote control unit with the remote control unit cord exposed, use pliers to cut a notch into the upper case. (The feeding-out direction can be either up or to the left or right.)**
- **Strip the end of the remote control cord which is to be connected to the remote control unit. (Refer to the illustration at right.)**


Approx. 7 mm
Approx. 20 mm

- Route the remote control cord inside the lower case inaccordance with the intended feeding-out direction. (Refer tothe illustration below)Securely connect connector CN1. (If it is not connected, theremote control unit will not operate.)


Do not suspend
the upper case.
(An open circuit
may result.)

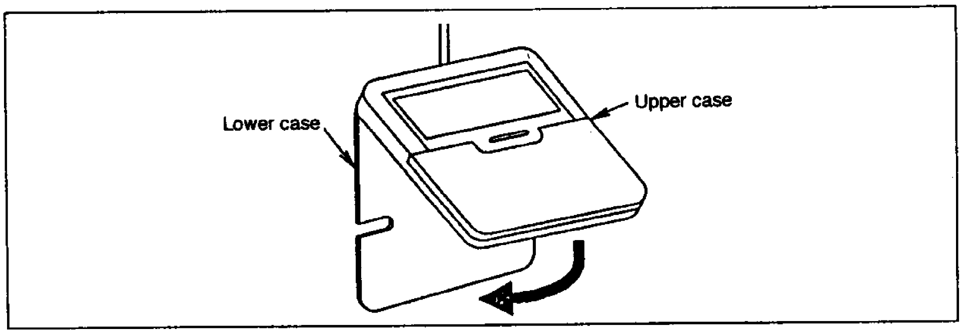
NOTE / ▲ After connecting the connector, do not suspend the upper case by its own weight, otherwise the connector cord may break.

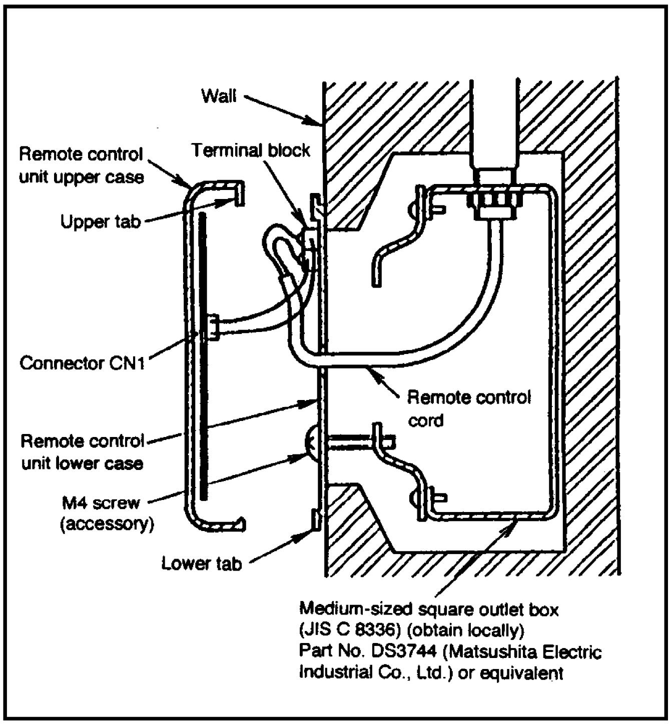
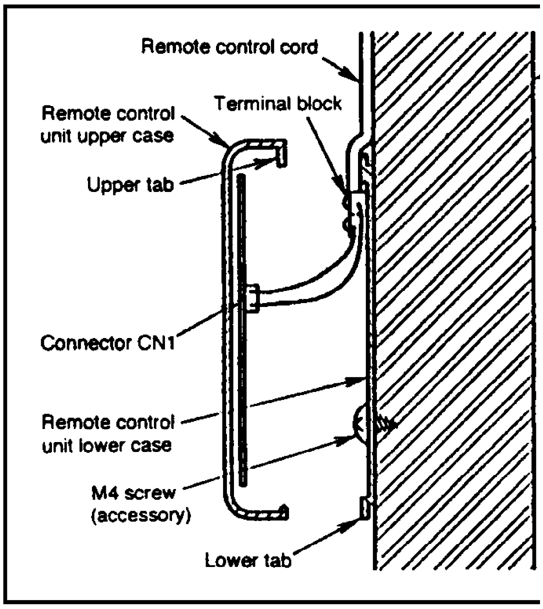

Notches
Top feeding-out position
Connector cord
Lower case
Left feeding-out position
Remote control cord
Rear feeding-out position (when cord is to be embedded)
Right feeding-out position
Tab
Upper case
Connector CN1
Main
Sub
Ventilation holes
Temperature sensor
Setting switch

- If controlling using two remote control units, refer to "Control using two remote control units" in "4.Settings".

- Secure the upper case to the lower case. / (Hook the upper tab of the upper case into the lower case, and then push the upper case

until it snaps / shut onto the lower case tab, while being careful not to clamp the remote control cord and the / connector cord.)


Lower case
Upper case

If remote control cord is embedded	If installing with the remote control cord
1. Embed an outlet box (JIS C 8336) into the wall, and then secure the remote control unit base plate to the outlet box with the two accessory M4 screws. Make sure that the base plate is flat against the wall at this time, with no bending (looseness). 2. Pass the remote control cord into the box and then install the remote control unit.  Wall Remote control unit upper case Terminal block Upper tab Connector CN1 Remote control cord Remote control unit lower case M4 screw (accessory) Lower tab Medium-sized square outlet box (JIS C 8336) (obtain locally) Part No. DS3744 (Matsushita Electric Industrial Co., Ltd.) or equivalent	1. Secure the remote control unit base plate to the wall with t accessory 4 mm screws. 2. The feeding-out direction for the remote control unit cord up or to the left or right. (Refer to the illustration above.) Afte the feeding-out direction, use pliers to make a notch in the c 3. Route the remote control cord as shown in the illustration the cord firmly around the outside of the base plate at this ti  Remote control cord Remote control unit upper case Terminal block Upper tab Connector CN1 Remote control unit lower case M4 screw (accessory) Lower tab

24.7.3. Setting

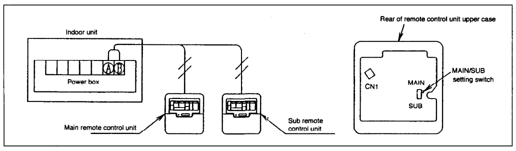
Control using two remote control unit

- Up to two remote control units can be installed for a single indoor unit, and either remote control unit can be used to operate the indoor unit.

- The indoor unit can be operated with the last switch pressed having priority.

1. Decide which is to be the main and which is to be the sub remote control unit. The main or the sub status of the remote control unit is set automatically. The MAIN/SUB setting switch can also be used to make the setting manually, however if the manual setting is made, that manual setting has priority. Be sure to turn off the main power before making the manual setting.

2. Connect the remote control units. / Connect both remote control units to terminals (A) and (B) on the indoor unit terminal block (non-polar)


Indoor unit
A
B
Power box
Main remote control unit
Sub remote control unit
Rear of remote control unit upper case
CN1
MAIN
SUB
MAIN/SUB setting switch

24.7.4. Test operation

- Turn on the main power.

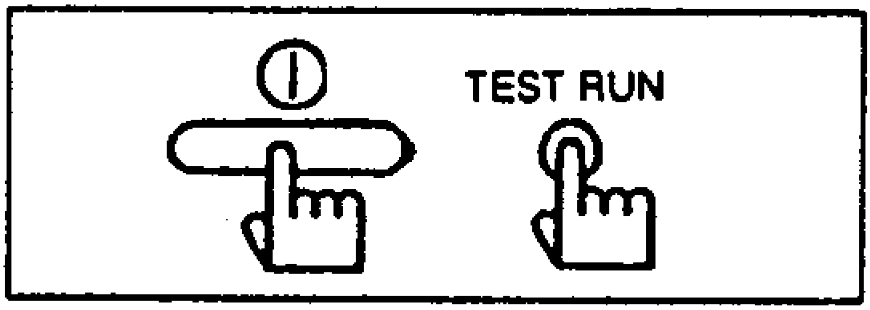
- After 3 minutes have passed since the power was turned on, press the STOP/RUN switch on the remote control unit. (No operation occurs within 3 minutes after the power was turned on.)

- Press the TEST RUN switch within 1 minute of pressing the STOP/RUN switch.

- Next, select the operation mode. (Be sure to select the cooling mode first, and run the unit in this mode for 5 minutes or more.)

- Press the STOP/RUN switch or the TEST RUN switch to cancel the test operation.

- Test operation will be cancelled automatically after 30 minutes.

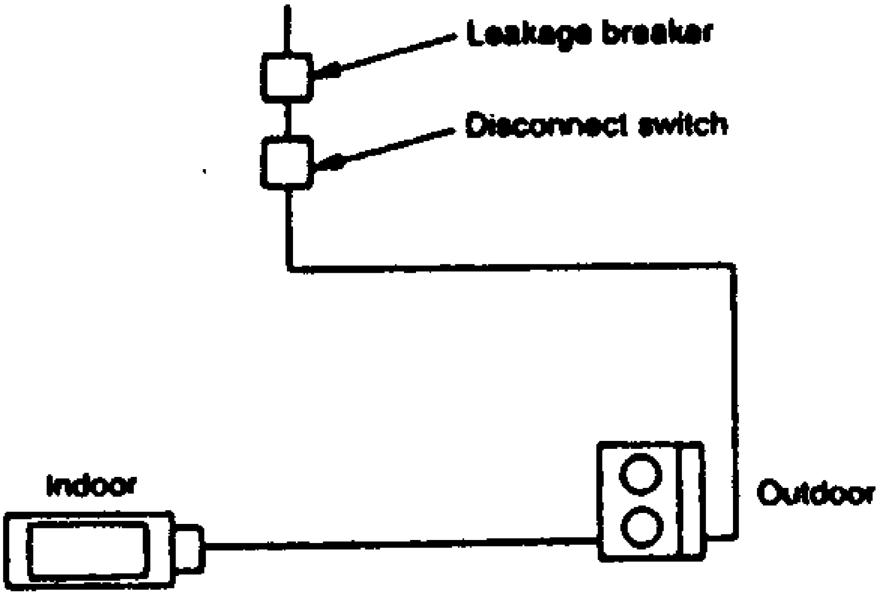


If no remote control unit displays appear

- Check whether LED1 (green) on the indoor unit printed circuit board is illuminated or switched off. If it is switched off, check the circuits on the indoor unit printed circuit board.
- Check once more that the remote control cord is securely connected. (Check for loose terminals, poor contacts, connection positions on terminal block, etc.)
- If the above checks show that nothing is wrong but nothing appears on the remote control unit display, it is possible that the remote control unit was connected while the main power was still turned on. If such is the case, carry out the following.
- Set DIP switch (DSW1) Nos 1 to 4 to the ON position, and then turn the power back on. If the display appears after about 30 seconds, turn DIP switches 1 to 4 back to OFF.

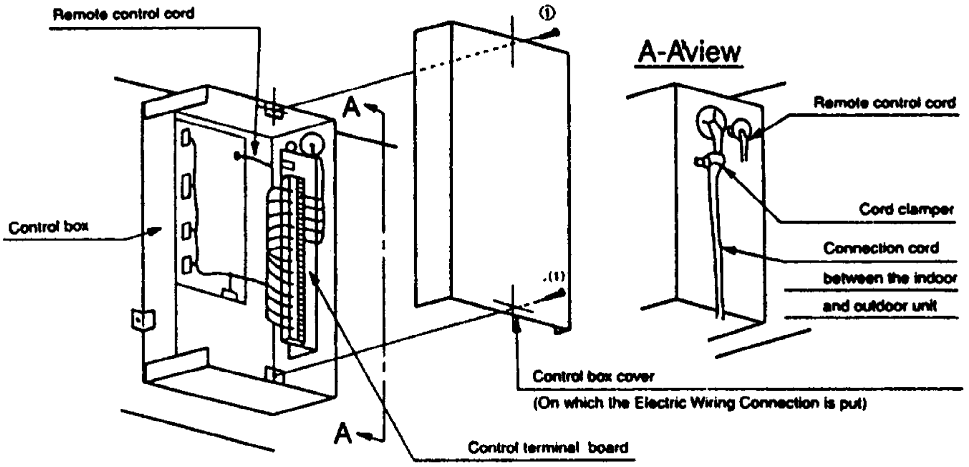
24.8. ELECTRICAL WIRING

- All wiring must comply with local requirements.
- Select a power source that is capable of supplying the current required by the air conditioner.


Leakage breaker
Disconnect switch
Indoor
Outdoor

WIRING CONNECTION
<INDOOR UNIT>

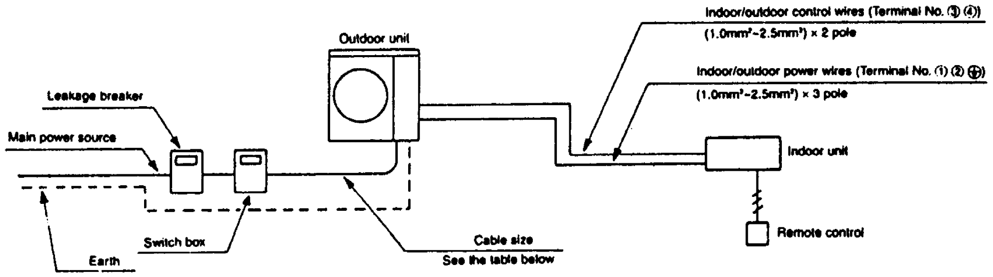
- **Remove the control box cover for electrical connection between the indoor and outdoor unit. (Remove two screws no.(1).**
- **Use the cord clamper to fix the cord.**


Remote control cord
①
A-A'view
Remote control cord
A
Cord clamper
Control box
Connection cord
between the indoor
and outdoor unit
(1)
Control box cover
(On which the Electric Wiring Connection is put)
A
Control terminal board

Caution
Make sure the screws of the terminals are correctly tightened. Fastening torque / M4 → 118N.cm {12kgf.cm} / M5 → 196N.cm (20kgf.cm}

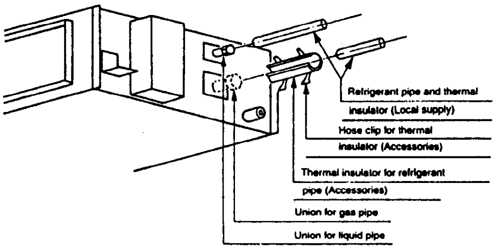
24.9. ELECTRICAL WIRING

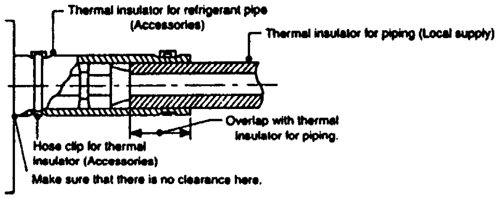
1. **All wiring must comply with LOCAL REGULATIONS.**
2. **Select a power source that is capable of supplying the current required by the air conditioner.**
3. **Feed the power source to the unit via a distribution switchboard designed for this purpose.**
4. **Install a leakage breaker if the electrical wiring is subject to excessive moisture.**
5. **The terminal screws inside the control box may be loose due to vibration due to transport. Check the screws for loose connection. (Running the air conditioner with loose connection can overload and damage electrical components.)**
6. **Check that the cable size, overcurrent devices, and switch specifications comply with those given in the table.**
    - **The wire diameters in the table indicate values compatible with a metal or resin conduit that can pass up to three such wires.**
    - **The overall length in the table indicates a value when the main power cord is subject to a voltage drop of 1%.**
7. **Always ground the air conditioner with a grounding wire and screw to meet the LOCAL REGULATIONS.**
8. **Be sure to connect the wires correctly to terminal block with connecting the crimp type ring terminal to the wires.**

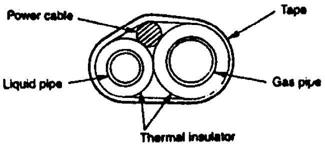

Indoor/outdoor control wires (Terminal No. ③ ④)
(1.0mm²~2.5mm²) × 2 pole
Outdoor unit
Indoor/outdoor power wires (Terminal No. ① ② ⊕)
(1.0mm²~2.5mm²) × 3 pole
Leakage breaker
Main power source
Indoor unit
Remote control
Switch box
Cable size
See the table below
Earth

24.10. HEAT INSULATION

THERMAL INSULATION
<INDOOR UNIT>


Refrigerant pipe and thermal insulator (Local supply)
Hose clip for thermal insulator (Accessories)
Thermal insulator for refrigerant pipe (Accessories)
Union for gas pipe
Union for liquid pipe

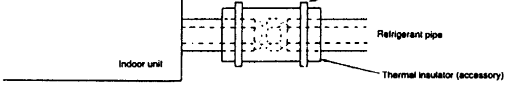

Thermal insulator for refrigerant pipe (Accessories)
Thermal insulator for piping (Local supply)
Overlap with thermal insulator for piping.
Hose clip for thermal insulator (Accessories)
Make sure that there is no clearance here.


Power cable
Tape
Liquid pipe
Gas pipe
Thermal insulator

<REFRIGERANT PIPE>

- Insulate and tape both the gas piping and liquid piping.

1. **For refrigerant and drain pipings, execute referencing the piping procedure label packed with the unit body.**
2. **Use the heat insulation material for the refrigerant piping which has an excellent heat resistance (over 120°C)**


Fastening band (accessory)
Refrigerant pipe
Indoor unit
Thermal insulator (accessory)

3. Precautions in high humidity circumstance: / This air conditioner has been tested according to the "JIS Standard Conditions with Mist" and confirmed that there is not any fault. However if it is operated for a long time in high humid atmosphere (dew point temperature: more than 23°C), water drops are liable to fall. In this case, add heat insulation material according to the following procedure:

- **Heat insulation material to be prepared. Adiabatic glass wool with thickness 10 to 20mm.**
- **Stick all glass wool on all air conditioners that are located in ceiling atmosphere.**
- **In addition to the normal heat insulation (thickness: more than 8mm) for refrigerant piping (gas piping: thick piping) and drain piping, add further 10mm to 30mm thickness material.**

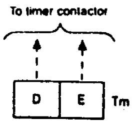
24.11. SELF DIAGNOSIS FUNCTION

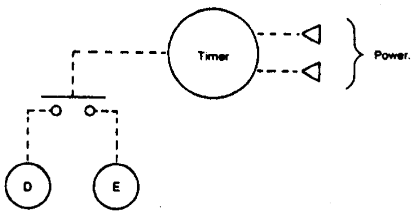
- **If LED5 (yellow) is flashing, the microcomputer in the electronic controller is functioning normally.If LED5 is lighting steady, OFF, or flashing irregularly, try turning the power off and then on again.**
- **You can find the fault point by the remote control indicator or the self-diagnosis LEDS on the indoor and outdoor electronic controller.**
- **CHECK will flash in the remote control indicator when a problem occurs.**
- **When the CHECK switch is pushed , the problem will be dislayed in the indoor temperature setting display**
- **Correct the accident point as shown in the table below before restarting operation.**
- **Accident points are stored in memory.**
- **During fault normal operations, pressing the CHECK switch for 5 sec or longer will display the contents of the previous accident points.**
- **Press the CHECK switch again to restore the normal display.**

Remote control indicator	Indoor LED				Outlet LED				FAULT POINT	CHECK P
	LED1	LED2	LED3	LED4	LED1	LED2	LED3	LED4		
F2	● Light on	●		●	●				Water level float switch	Drain pump anc piping
F3		●			●				Indoor temperature thermistor	Indoor tempera thermistor cord
F4			●		●				Piping thermistor	Piping thermist
F5	●	●	●	●	●				Remote control data transfer error	Data transmissi waveform
	●	●			●				Remote control connection cord (disconnect)	Remote control connection tern
F6		●	●	●	●				Indoor/outdoor unit data transfer error	Indoor/outdoor transmission w
			●	●	●				Indoor/outdoor unit connection cord (disconnect)	Indoor/outdoor and connection
									Compressor bimetal thermistor operating	Gas leaks, outd power supply, i unit connecting
			●	●					Outdoor unit over current protector	Compressor op phase, or lockir
									Phase protector operating	Outdoor unit pc supply negative
F15	●				●	●			High pressure switch operating	Outdoor unit
F18	●		●				●		Outdoor piping temperature thermistor	Piping temperat thermistor cord

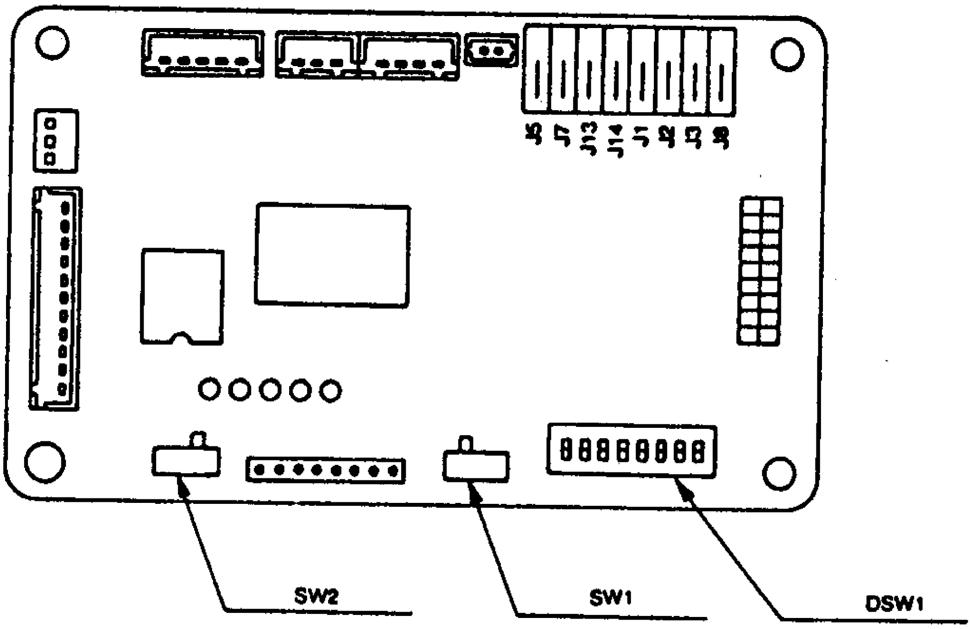
24.12. USE OF TIMER (LOCAL ARRANGEMENTS)

Connect the contactor of the timer to "TM„ Ⓓ and Ⓔ.





24.13. INDOOR UNIT PRINTED CIRCUIT BOARD (MICROCOMPUTER BOARD)



Use of jumper wire

J1	J1	J2	DIFFERENTIAL
	EXIST	EXIST	2°C
J2	NOT	EXIST	1.5°C
	EXIST	NOT	2.5°C

Use of switch

Switch	Subject	ON/OFF
SW1	Twin.Triple	Master/Slave
SW2	Emergency operation	Emergency/Normal
DSW1 1 ~ 4	Indoor Unit adress	Please refer to the installation instruction sheet
DSW1 5 ~ 8	Do not change this switch	If change the switch, unit will will not operate properly

CAUTION

- Use "SW2" with normal position.

- Emergency position of "SW2" take force operation of indoor fan &

Drain up motor.

- Do not touch No. 5~8 of "DSW1".

24.14. TEST OPERATION

The initial power supply must provide at least 90% of the rated voltage.
Otherwise, the air conditioner should not be operated.

- The remote control is used to execute a test run.

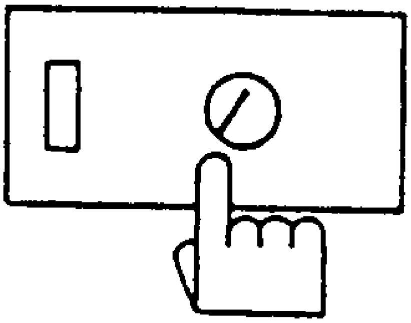
- Press the ON/OFF (⏽) switch first.

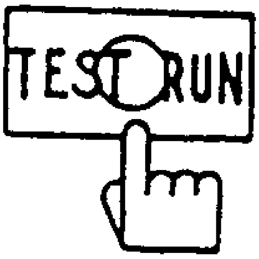
- Press the TEST RUN switch within one minute after the ON/OFF (⏽) switch

- Select the operation mode.

- To cancel the test run, press the TEST RUN switch again.

- * The test run terminates automatically after 30 minutes.





For the test operation, press the push buttons in the order shown

POWER-ON → COOLING → TEST RUN -ON (operated for five to eight minutes) → POWER OFF

24.15. CHECK THE FOLLOWING ITEMS WHEN INSTALLATION IS COMPLETE

- **After completing work, be sure to measure and record trial run properties, and store measuring data. etc.**
- **Measured items are room temperature. outside temperature. suction temperature. blow out temperature. wind speed. wind amount. voltage. current. abnormal vibration. abnormal noise. running pressure. pipe temperature. withstand pressure and air tight pressure.**
- **As for structure and appearance, check on the below items.**

☐ Is circulation of air adequate?
☐ Is draining smooth?
☐ Is heat insulation complete?
(refrigerant and drain piping)
☐ Is there any leakage of refrigerant?
☐ Is remote control switch operated?
☐ Are there any faulty wiring?
☐ Are not terminal screws loosened?
☐ Tightening torque (N • cm {kgf • cm})
M4...118 {12}, M5...196 {20}
M6...245 {25}, M8...588 {61}

24.16. DELIVERY TO OUR CUSTOMERS

- **Teach the customers the operation and maintenance procedures, using the operation manual (air filter cleaning, temperature control, etc,)**

As for work specifications of the outdoor unit, read the WORK INSTRUCTION attached to the outdoor unit.

25. INSTALLATION (OUTDOOR UNIT)

AIR CONDITIONERS OUTDOOR UNIT INSTALLATION INSTRUCTIONS

REFRIGERANT
R22

HP	Panasonic Model		National Model	
2.5 HP	CU-A24BBP5	CU-C24BBP5	CU-C24BBN5	CU-C24BBN6
3 HP	CU-A28BBP5 CU-A28BBP8	CU-C28BBP5 CU-C28BBP6 CU-C28BBP8	CU-C28BBN5 CU-C28BBN6 CU-C28BBN8	
4 HP	CU-A34BBP5 CU-A34BBP8	CU-C34BBP5 CU-C34BBP7 CU-C34BBP8	CU-C34BBN7 CU-C34BBN8	
5 HP	CU-A43BBP8	CU-C43BBP7 CU-C43BBP8	CU-C43BBN7 CU-C43BBN8	
6 HP	CU-A50BBP8	CU-C50BBP7 CU-C50BBP8	CU-C50BBN7 CU-C50BBN8	

Precautions in terms of safety

Carry out installation work with reliability after thorough reading of this “Precaution in terms of safety”.

- Precautions shown here are differentiated between ⚠Warnings and ⚠Cautions. Those that have much chances for leading to significant result such as fatality or serious injury if wrong installation would have been carried out are listed compiling them especially into the column of ⚠Warnings.

  However, even in the case of items which are listed in the column of ⚠Cautions, such items also have a chance for leading to significant result depending on the situations.
  In either case, important descriptions regarding the safety are listed, then observe them without fail.
- As to indications with illustration

  ⚠ This mark means “Caution” or “Warning”.　　⚠ This mark means “Earth”.
- After installation work has been completed, do not only make sure that the unit is free from any abnormal condition through the execution of try run but also explain how to use and how to perform maintenance of this unit to the customer according to the instruction manual.
  In addition, request the customer to keep this manual for installation work together with instruction manual.

⚠ Warnings

▲ The appliance must be installed by technician, who takes into account the requirements given by ISO5149 or eventual equivalent requirements.

▲ As to installation, request the distributor or vendor to perform it. Imperfection in installation caused by that having been carried out by the customer himself may lead to water leakage, electric shock, fire, etc.

▲ Carry out the installation work with reliability according to this manual for installation work.
Imperfection in installation leads to water leakage, electric shock, fire, etc.

▲ Carry out the installation work with reliability on the place that can bear the weight of this unit sufficiently. Insufficient strength leads to injury due to falling of the unit.

▲ Carry out predetermined installation work in preparation for strong wind such as typhoon, earthquake. Imperfection in installation work may lead to accidents arisen from overturn, etc.

▲ The unit must be installed in accordance with applicable national and local regulations.
Any electrical work should only be carried out by qualified technician and use exclusive circuits without fail.
Presence of insufficient capacity in power circuit or imperfection in execution leads to electric shock, fire, etc.

▲ Wiring shall be connected securely using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section.
Imperfect connection and fixing leads to fire, etc.

▲ If installing inside a small room, measures should be taken to prevent refrigerant levels from building up to critical concentrations in the event of a refrigerant leak occurring. Please discuss with the place of purchase for advice on what measures may be necessary to prevent critical concentrations being exceeded. If the refrigerant leaks and reaches critical concentration levels, there is the danger that death from suffocation may result.

▲ Securely attach the protective covers for the outdoor unit connection cables and power cord so that they do not lift up after installation. If the covers are not properly attached and installed, the terminal connections may overheat, and fire or electric shock may result.

▲ Switch off all supplies before accessing any electrical part.

▲ If refrigerant gas escapes during installation, ventilate the affected area. If the refrigerant gas comes into contact with sparks or naked flames, it will cause toxic gases to be generated.

▲ Once installation work is completed, check that there are no refrigerant gas in the room that can come into contact with sparks or flames from a fan heater, stove or kitchen range, which will cause toxic gases to be generated.

▲ When performing piping work do not mix air except for specified refrigerant (R22) in refrigeration cycle. It causes capacity down, and risk of explosion and injury due to high tension inside the refrigerant cycle.

⚠ Cautions

▲ Carry out Earthing work.
Do not connect the Earth return to the gas pipe, water line pipe, lightning rod and telephone lines.
Imperfection in Earth return may lead to electric shock.

▲ Do not install the unit at the place where the possibility of inflammable gas leakage exists. If such gas leakages should arise and the gas builds up around the unit, such situation may lead to ignition.

▲ Mounting of the earth leakage circuit breaker is required. Omission in mounting of the earth leakage circuit breaker may lead to electric shock.

▲ Drain piping should be made to ensure secure drainage according to the manual for installation work and carry out the thermal insulation to prevent the occurrence of condensation.
Imperfection in piping work leads to water leakage and may cause the house and property, etc. to become wet.

▲ Position the indoor unit and outdoor unit, power cords and indoor/outdoor unit connection cables in a way so that they are at least 1 metre away from televisions and radios.
This is to avoid problems such as interference with picture and/or sound. (However, note that depending on the electromagnetic wave conditions, interference may still occur even if the separation distance is more than 1 metre.)

1. ACCESSORIES SUPPLIED WITH OUTDOOR UNIT

- The following parts are supplied as accessories with each outdoor unit.
  Check that all accessory parts are present before installing the outdoor unit.

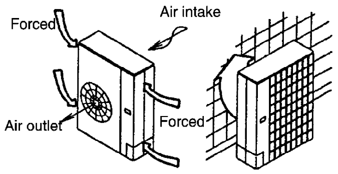
Part name	Q'ty	Diagram	Application
Protective bushing	2		For protecting electrical wires
Banding strap	3		For tying electrical wires together

Heat pump-types only

Part name	Q'ty	Diagram	Application
Drain elbow AS	1		For connecting the drain pipe (with ring seat)

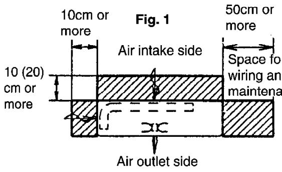
2. SELECTING THE OUTDOOR UNIT INSTALLATION LOCATIONS

- Select location which satisfies the following condition, and then confirm with the customer that such a place is satisfactory before installing the outdoor unit.
  1. There should be sufficient ventilation.
  2. The outdoor unit should be sheltered as much as possible from rain and direct sunlight, and the air should be able to move around so that hot and cold air do not build up.
  3. There should not be animals or plants near the air outlet which could be adversely affected by hot or cold air coming out from the unit.
  4. The outlet air and operating noise should not be a nuisance to other occupants nearby.
  5. The location should be able to withstand the full weight and vibration of the outdoor unit, and it should also be level and safe for the unit to be installed.
  6. The intake and outlet should not be covered.
  7. There should not be danger of flammable gas or corrosive gas leaks.
  8. There should be as little back-ventilation (air blowing directly onto the fan) as possible.
     (If strong wind blows directly onto the fan, it may cause problems with normal operation.)
     - If you know which direction the prevailing wind comes from during the operating season, set the outdoor unit at a right-angle to this wind direction, or so that the air outlet faces toward a wall or fence.
     - If there are obstructions near the outdoor unit and the wind direction is not constant, install an optional air guider.
  9. Do not allow any obstacles near the outdoor unit which will interfere with air flow around the air intake and air outlet.
  10. If installing in a location which is prone to snowfall, place the installation base as high as possible, and be sure to install a roof or enclosure which does not allow snow to accumulate.
  11. Avoid installing the unit in places where petroleum products (such as machine oil), salinity, sulphurous, gases or high-frequency noise are present.
  12. Be sure to leave enough space around the outdoor unit to maintain proper performance and to allow access for routine maintenance.
      - Allow enough space from any obstacles as shown in Fig.1.2 below in order to prevent short-circuits from occurring.
        (If installing more than one outdoor unit, make the necessary space available as outlined in 14.)
        However, there should be at least 1 metre of free space above the unit.
      - The height of any obstacles at the air intake and outlet sides should not be greater than the height of the outdoor unit.



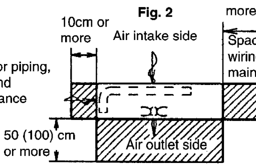
- When facing the air intake side toward a wall.

Fig. 1


10cm or more
50cm or more
Air intake side
Space for piping, wiring and maintenance
10 (20) cm or more
Air outlet side

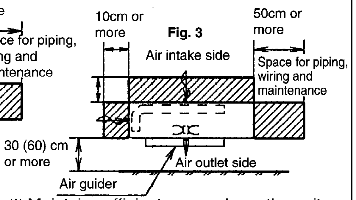
- When facing the air outlet side toward a wall.

Fig. 2


10cm or more
Air intake side
50cm or more
Space for piping, wiring and maintenance
50 (100) cm or more
Air outlet side

- When using an optional air guider for outdoor units.

Fig. 3


10cm or more
50cm or more
Air intake side
Space for piping, wiring and maintenance
30 (60) cm or more
Air outlet side
Air guider

✻ Maintain sufficient space above the unit.

13. If is not possible to leave 50 (100)cm at the air outlet side as shown in Fig.2, the installation method shown in Fig.3 can be used if an optional air guider for outdoor units is installed. Install according to the instructions given in the separate instruction manual.

(NOTE) When installing the air guider

1) If directing the air upward, there should not be obstacles above the outdoor unit.
2) If directing the air to the left or right, there should not be obstacles at the left or right of the outdoor unit.
3) Never use the air guider in locations which are subject to snowfall.
   If snow gets inside the air guider, it could cause the fan to freeze up.
4) If connecting outdoor units in series, direct the flow upward.

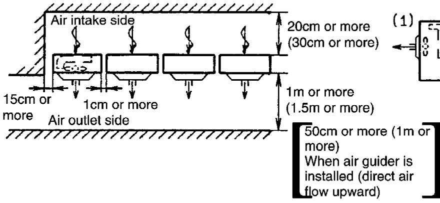
Air guider for outdoor units

Model Name		Part No.
CU-A24BBP5 CU-A28BBP5 CU-A28BBP8 CU-C28BBP5	CU-C24BBP5 CU-C28BBP6 CU-C28BBP8	CZ-UFS01P
CU-C24BBN5 CU-C28BBN5 CU-C28BBN8	CU-C24BBN6 CU-C28BBN6	CZ-UFS01N

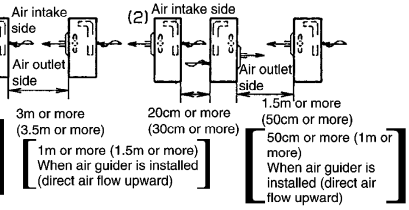
Model Name		Part No.
CU-A34BBP5 CU-C34BBP7 CU-C34BBP5 CU-A43BBP8 CU-C43BBP8 CU-A50BBP8 CU-C50BBP8	CU-A34BBP8 CU-C34BBP8 CU-C43BBP7 CU-C50BBP7	CZ-UFD01P
CU-C34BBN7 CU-C43BBN7 CU-C50BBN7	CU-C34BBN8 CU-C43BBN8 CU-C50BBN8	CZ-UFD01N

14.If installing more than one outdoor unit, allow enough space around each unit as shown below.

- When installing units side by side


Air intake side
20cm or more (30cm or more)
15cm or more
1cm or more
Air outlet side
1m or more (1.5m or more)
50cm or more (1m or more) When air guider is installed (direct air flow upward)

- When installing units facing each other


(1)
Air intake side
Air outlet side
3m or more (3.5m or more)
1m or more (1.5m or more) When air guider is installed (direct air flow upward)
(2)
Air intake side
Air outlet side
20cm or more (30cm or more)
1.5m or more (50cm or more)
50cm or more (1m or more) When air guider is installed (direct air flow upward)

✻ Maintain sufficient space above the unit.

Values inside brackets indicate distances when installing the 4HP-6HP.

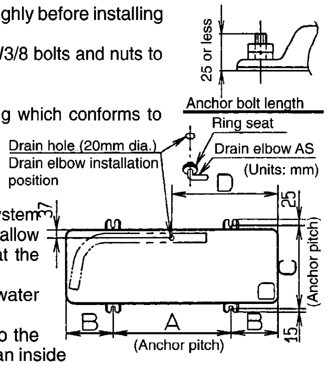
- The distance given above are the minimum distance required in order to maintain proper performance. Allow as much space as possible in order to get the best performance from the units.

3. TRANSPORTING AND INSTALLING THE OUTDOOR UNIT

- Transporting

1. The outdoor unit should be transported in its original packaging as close to the installation location as possible.
2. If suspending the outdoor unit, use a rope or belt, and use cloth or wood as padding in order to avoid damaging the unit.
3. Use the handles at left and right to transport the unit, and be careful not to touch your hands or other objects against the fan.

- Installation
  1. Read the “Selecting the outdoor unit installation location” section thoroughly before installing the outdoor unit.
  2. If installing the unit to a concrete base or other solid base, use M10 or W3/8 bolts and nuts to secure the unit, and ensure that the unit is fully upright and level.
     (The anchor bolt positions are shown in the diagram at the right side.)
     In particular, install the unit at a distance from the neighbouring building which conforms to regulations specified by local noise emission regulation standards.
  3. Do not install the outdoor unit to the building’s roof.
  4. If there is a possibility that vibration may be transmitted to the rooms of the building, place rubber insulation between the unit and the installation surface.
  5. Drain water will be discharged from the outdoor unit when operating the system in heating or defrosting modes. Select an installation location which will allow the water to drain away properly, or provide a drainage channel so that the water can drain away.
     (If this is not done, the drain water may freeze during winter, or the water may spill down to areas underneath the installation location.)



- If a drain pipe needs to be installed, insert the accesory drain elbow into the mounting hole at the bottom of the outdoor unit, and connect a hose with an inside diameter of 15mm to this drain elbow.
  (The hose is not supplied.)

✻ If using the drain elbow, install the outdoor unit on a base which is at least 5cm high.

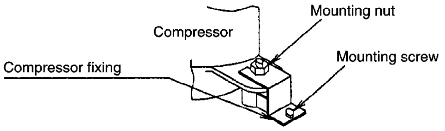
Anchor bolt position

Model Name	Amm	Bmm	Cmm	Dmm
CU-A24BBP5 CU-C24BBP5 CU-A28BBP5 CU-C28BBP6 CU-A28BBP8 CU-C28BBP8 CU-C28BBP5 CU-C24BBN5 CU-C24BBN6 CU-C28BBN5 CU-C28BBN6 CU-C28BBN8 CU-A34BBP5 CU-A34BBP8 CU-C34BBP7 CU-C34BBP5 CU-C34BBP8 CU-C34BBN7 CU-C34BBN8	500	200	360	450
CU-A43BBP8 CU-C43BBP7 CU-C43BBP8 CU-C43BBN7 CU-C43BBN8 CU-A50BBP8 CU-C50BBP7 CU-C50BBP8 CU-C50BBN7 CU-C50BBN8	700	200	360	720

NOTE In cold regions (where the outdoor air temperature can drop to 0˚C or below continuously for 2-3 days), the drain water may freeze, and this may prevent the fan from operating. Do not use the drain elbow in such cases.

CAUTION

- Be sure to remove the compressor fixing brackets.
  (Some models are not equipped with compressor fixing brackets.)
- To remove, first remove the mounting screws, loosen the compressor mounting nuts and then pull sideways.
- After removing, be sure to tighten the compressor mounting nuts again.

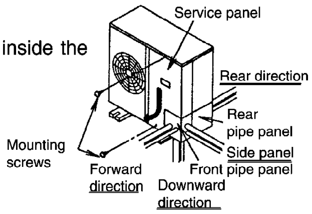


4. CONNECTING THE PIPES

✻ This product is used new refrigeration (R407C).

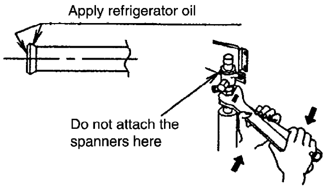
- Use a clean pipe which does not include water or dust for inside of piping.
- When cutting the refrigerant pipes, a piping cutter must be used. Before connecting the refrigerant pipes blow nitrogen and blow off dust in the pipes.
  (Never use tools which cause a lot of dust such as a saw and a magnet.)
- When waxing replace nitrogen inside the piping after removing dirt and dust. (In order to prevent oxidization scale from forming inside the piping).
- The refrigerant pipes are of particular importance.
  The installation work for refrigerant cycles in separate-type air conditioners must be carried out perfectly.

Model Name	Pipe diameter (mm)		Equivalent length (m)	Difference of elevation (m)
	Liquid-side pipes	Gas-side pipes		
CU-A24BBP5 CU-C24BBP5 CU-C24BBN5 CU-C24BBN6	ø6.35	ø15.88	50	30
CU-A28BBP5 CU-A28BBP8 CU-C28BBP8 CU-C28BBP5 CU-C28BBP6 CU-C28BBN5 CU-C28BBN6 CU-C28BBN8	ø9.52	ø15.88	50	30
CU-A34BBP5 CU-A34BBP8 CU-C34BBP7 CU-C34BBP5 CU-C34BBP8 CU-C34BBN7 CU-C34BBN8 CU-A43BBP8 CU-C43BBP7 CU-C43BBP8 CU-C43BBN7 CU-C43BBN8 CU-A50BBP8 CU-C50BBP7 CU-C50BBP8 CU-C50BBN7 CU-C50BBN8	ø9.52	ø19.05	50	30



1. Local pipes can project in any of four directions.
   - Make holes in the pipe panels for the pipes to pass through.
   - Be sure to install the pipe panels to prevent rain from getting inside the outdoor unit.
     [Removing the service panel].
     (1) Remove the two mounting screws.
     (2) Slide the service panel downward to release the pawls.
     After this, pull the service panel toward you to remove it.
2. Notes when connecting the refrigerant pipes.
   - Use clean copper, pipes with no water or dust on the insides.
   - Use phosphorus-free, unjointed copper pipes for the refrigerant pipes.
   - If it is necessary to cut the refrigerant pipes, be sure to use a pipe cutter, and use compressed nitrogen or an air blower to clean out any foreign particles from inside the pipe.
   - Be careful not to let any dust, foreign materials or water get inside the pipes during connection.
   - If bending the pipes, allow as large a bending radius as possible. Do not flex the pipes any more than necessary.
   - If joining pipe ends, do so before tightening the flare nut.
   - Always blow the pipe end with nitrogen while joining pipe ends.
     (This will prevent any oxide scaling from occurring inside the pipe.)
   - If using long pipe lengths with several joined pipe ends, insert strainers inside the pipes.(Strainers are not supplied.)
   - When tightening the flare nuts, coat the flares (both inside surfaces) with a small amount of refrigerator oil, and screw in about 3-4 turns at first by hand.
   - Refer to the following table for the tightening torques. Be sure to use two spanners to tighten.
     (If the nuts are overtightened, it may cause the flares to break or leak.)

Flare nut fastening torque N•m (kgf•cm)			
ø6.35mm	18 (180)	ø15.88mm	65 (660)
ø9.52mm	42 (430)	ø19.05mm	100 (1020)
ø12.7mm	55 (560)		



3. After piping connection has been completed, make sure that the joint areas of the indoor and outdoor units are free from gas leakage by the use of nitrogen, etc.
4. Air purge within connection piping shall be carried out by evacuation.

5. HEAT INSULATION

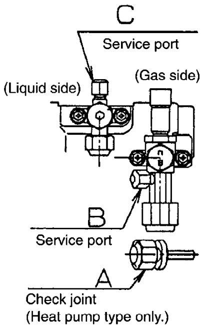
⚠ Caution	Use a material with good heat-resistant properties as the heat insulation for the pipes. Be sure to insulate both the gas-side and liquid-side pipes. If the pipes are not adequately insulated, condensation or water leakages may occur.

Liquid-side pipes	Material that can withstand 120˚C or higher
Gas-side pipes	

6. CHARGING WITH REFRIGERANT

- At the time of shipment from the factory, this unit is charged with enough refrigerant for an equivalent pipe length of 30m. If the equivalent pipe length used will be 30m or less, no additional charging will be necessary.
- If the equivalent pipe length will be between 30 and 50m (40m), charge with additional refrigerant according to the equivalent length given in the table below.
  - For standard type

Model Name	Additional charging amount	Equivalent length
CU-A24BBP5 CU-C24BBP5 CU-C24BBN5 CU-C24BBN6	0.02kg/m	50m
CU-A28BBP5 CU-A28BBP8 CU-C28BBP8 CU-C28BBP5 CU-C28BBP6 CU-C28BBN5 CU-C28BBN6 CU-C28BBN8 CU-A34BBP5 CU-A34BBP8 CU-C34BBP7 CU-C34BBP5 CU-C34BBP8 CU-C34BBN7 CU-C34BBN8 CU-A43BBP8 CU-C43BBP7 CU-C43BBP8 CU-C43BBN7 CU-C43BBN8 CU-A50BBP8 CU-C50BBP7 CU-C50BBP8 CU-C50BBN7 CU-C50BBN8	0.05kg/m	



- Attention when pump down operation
  - This outdoor unit is equipped with the low pressure switch for the protection of the compressor.
    Therefore, operate the pump down according to the following procedures.

CAUTION Do not short-circuit the low pressure switch.

Procedure	Notes
1. Confirm the valve on the liquid side and the gas side is surely open.	
2. Press the COOL switch on outdoor printed board for 1 second or more.	Perform the cooling operation for five minutes or more.
3. Shut the valve on the liquid side surely.	When the valve is shut halfway, the compressor is occasionally damaged.
4. The low pressure switch operates, the unit stops, and then shut the valve on the gas side immediately.	

The pump down is completed above.

CHECKING THE PRESSURE

Check the pressure at the service port on the valve and the check joint where the pipe ends have been joined according to the table at below.

Heat pump model

	A	B
During cooling operation	High pressure	Low pressure
During heating operation	Low pressure	High pressure

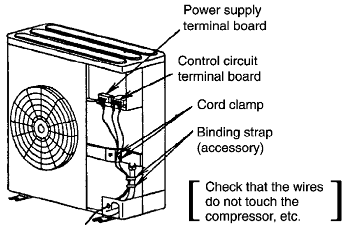
Cooling model only

	C	B
During cooling operation	High pressure	Low pressure

7. ELECTRICAL WIRING

⚠ Warning	The units must be connected to the supply cables for fixed wiring by qualified technician. Feed the power source to the unit via a distribution switch board designed for this purpose, the switch should disconnected all poles with a contact separation of at least 3mm. When the supply cable is damaged, it must be replaced by qualified technician.
⚠ Caution	Be sure to install a current leakage breaker, main switch and fuse to the main power supply, otherwise electric shocks may result.
⚠ Caution	Be sure to connect the unit to secure earth connection. If the earthing work is not carried out properly, electric shocks may result. ⏚
⚠ Warning	Wiring shall be connected securely by using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section. Imperfect connection and fixing leads to fire, etc.

- Connect the power supply wiring and indoor/outdoor unit connection wiring according to the electrical circuit diagram instructions.
- Clamp the wires securely to the terminal connections using cord clamps so that no undue force is placed on the wires.
- Once all wiring work has been completed, tie the wires and cords together with the binding strap so that they do not touch other parts such as the compressor and pipes.


Power supply terminal board
Control circuit terminal board
Cord clamp
Binding strap (accessory)
Check that the wires do not touch the compressor, etc.

1. Connect the power supply line to a 3-phase/380-415V (or single-phase 220-240V) power supply.

   If the phase is reversed, the self-diagnosis function will be activated and the unit will not operate. In such cases, switch over any two of the power supply wires (L1,L2,L3) (3-phase models only).

   (Never operate the unit by pressing the electromagnetic switch.)
2. The equipment shall be connected to a suitable mains network with a main impedance less than the valve indicated in the table of power supply specifications.
3. Be sure to connect the wires correctly to terminal board with connecting the crimp type ring terminal to the wires.
4. The binding screws inside the power supply box may become loosened due to vibration during transportation, so check that they are tightened securely.
5. Tighten the binding screws to the specified torque while referring to the table below.
6. If connecting two separate wires to a single crimped terminal, place the two crimped terminal wires together as shown in Fig. A. (If the arrangement shown in Fig. B is used, poor contacts or contact damage may result.)
7. If momentarily turning on the power supply for both the indoor and outdoor units, do not turn the power off again until at least 1 minute has passed (except when a reversed phase has been detected).

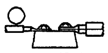


Fig A (OK)

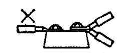


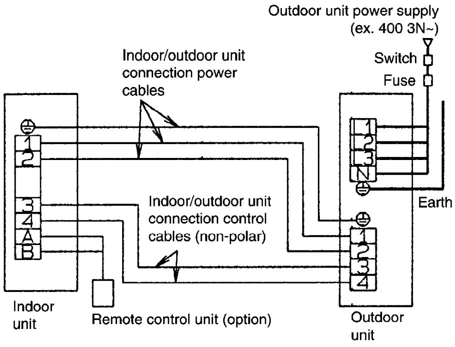
Fig B (not OK)

⚠ Warning	Use only the specified cables for wiring connections. Connect the cable securely, and secure them properly so that no undue force will be applied to the terminal connections. If the terminals are loose or if the wires are not connected securely, fire may result.

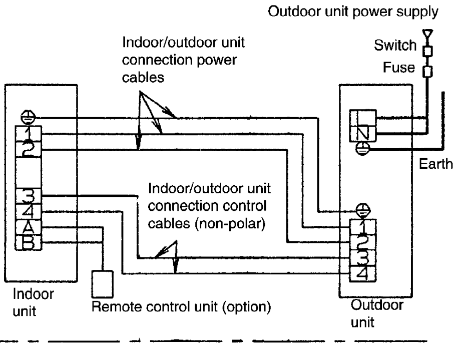
Terminal screw	Tightening torque N•cm {kgf•cm}
M3	69~98 {7~10}
M4	157~196 {16~20}
M5	196~245 {20~25}

Refer to the following diagrams for details on how to connect the power supply cables and indoor/outdoor unit connection cables.

OUTDOOR UNIT/3-PHASE MODEL


Outdoor unit power supply (ex. 400 3N~)
Indoor/outdoor unit connection power cables
Switch
Fuse
1
2
3
4
A
B
1
2
3
N
Earth
Indoor/outdoor unit connection control cables (non-polar)
1
2
3
4
Indoor unit
Remote control unit (option)
Outdoor unit

OUTDOOR UNIT/SINGLE-PHASE MODEL


Outdoor unit power supply
Indoor/outdoor unit connection power cables
Switch
Fuse
L
N
Earth
1
2
3
4
A
B
Indoor/outdoor unit connection control cables (non-polar)
1
2
3
4
Indoor unit
Remote control unit (option)
Outdoor unit

- Power supply specifications

Model name		Leakage current breaker (A)	Circuit breaker (Minimum Capacity)		Minimum power supply cables	$4mm^2$ cable based on length (m)	Indoor/outdoor unit connection power cables (terminals ① ② ⏚)	Indoor/outdoor unit connection power cables (terminals ① ②)	Maximum permissible impedance (Ω)
			Switch (A)	Fuse (A)					
CU-A24BBP5 CU-C24BBP5 CU-C28BBN5	220V-240V~	30	30	30	$4mm^2$	15	$2.5mm^2$ x 3	$1.0mm^2$ x 2	0.1
CU-C24BBN6	220V~	30	30	30		12			—
CU-A28BBP5 CU-C28BBP5 CU-C28BBN5	220V-240V~	30	30	30		14			0.1
CU-C28BBP6 CU-C28BBN6	220V 3~	30	30	30		11			—
CU-A28BBP8 CU-C28BBP8 CU-C28BBN8	380V-415V 3N~	15	15	15		46			0.05
CU-A34BBP5 CU-C34BBP5	220V-240V~	40	40	40		10			0.05
CU-C34BBP7 CU-C34BBN7	220V 3~	30	30	30		17			—
CU-A34BBP8 CU-C34BBP8 CU-C34BBN8	380V-415V 3N~	20	20	20		36			0.04
CU-C43BBP7 CU-C43BBN7	220V 3~	40	40	40		13			—
CU-A43BBP8 CU-C43BBP8 CU-C43BBN8	380V-415V 3N~	20	20	20		28			0.03
CU-C50BBP7 CU-C50BBN7	220V 3~	50	50	50		11			—
CU-A50BBP8 CU-C50BBP8 CU-C50BBN8	380V-415V 3N~	20	20	20		24			0.02

NOTE

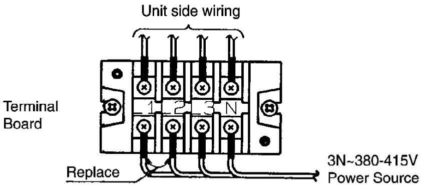
⃠ 1. Where ground work (earth) is carried out, do not connect the ground return to the gas pipe, water line pipe, grounded circuit of the telephone and lightning rod, or ground circuit of other product in which earth leakage breaker is incorporated. (Such action is prohibited by statute, etc.)

⚠ 2. In order to prevent malfunction (noise generation) of the equipment, carry out the wiring of the control cable for indoor and outdoor units (signal cable) isolating it from other power cable with separate cable.

3. Use the standard power supply cables for Europe (such as H05RN-F or H07RN-F which conforms to CENELEC (HAR) rating specifications) or use the cables based on IEC standard. (245IEC57, 245IEC66)
4. Select the particular size of electrical wire for power supply cables in accordance with the standards of the given nation and region.

CONNECTING POWER SUPPLY CABLES

- If reversed phase is detected and the self-diagnosis function is activated after connecting the power supply cables, carry out the following operation.
  Switch over any two of the power supply wires which are connected to the power supply terminal board.
  Turn off the main power supply before correcting the phase.



CAUTION

- Never operate the unit by pressing the electromagnetic switch.
- Never correct the phase by switching over any of the wires inside the unit.

NOTE When installing in Australia

As next enumeration unit is a single phase connection with a starting current greater than 45amps, it will be necessary to fit a starting device that lowers the starting current to no more than 45amps if it causes interference to electricity supply.

Single phase connection with greater than 45 amps unit

CU-A24BBP5 CU-C24BBP5 CU-A28BBP5 CU-C28BBP5 CU-A34BBP5 CU-C34BBP5

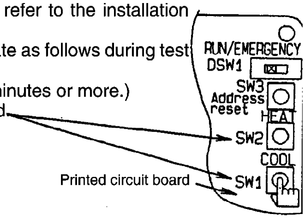
9. PRECAUTIONS WITH REGARD TO TEST OPERATION

CAUTION

- Always be sure to use a properly-insulated tool to operate the switch on the circuit board. (Do not use your finger or a metallic object.)
- Never turn on the power supply until all installation work has been completed.
- Turn on the circuitbreaker 12 hours or more before a test run. (By supplying power to crankcase heater, compressor is warmed and liquid compressing is prevented.)
- For three-phase models, check that the phase is not reversed.
  (If the phase is reversed, the LED on the printed circuit board will flash.)
- Check that the voltage is 90% of rated voltage or higher when starting the unit.
  (The unit will not operate if the voltage is less than 90% of rated voltage.)
- Test operation can be carried out using the remote control unit or by using the switch on the printed circuit board inside the outdoor unit.
  If carrying out test operation at the printed circuit board of the outdoor unit, follow the procedure given below. (If using the remote control unit to carry out test operation, refer to the installation manual which is supplied with the indoor unit.)
- Press the COOL or HEAT switch for 1 second or more. The LEDs will operate as follows during test operation.
  (Be sure to select cooling mode first, and run the units in this mode for 5 minutes or more.)

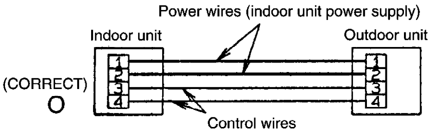
✳ The compressor will stop momentarily when the operation mode is changed.

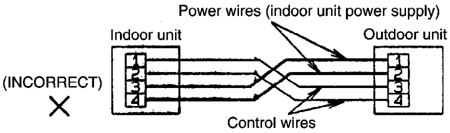
Test operation mode	LEDs on printed circuit board
Cooling test mode	LEDs 2-4 flash, LEDs 5-8 switch off
Heating test mode	LEDs 2-5 switch off, LEDs 6-8 flash



- Press the TEST button once more to cancel test operation mode.
- When performing heating test operation when the outside temperature is high, or cooling test operation when the outside temperature is low, the protection circuits may sometimes operate within a few minutes.

NOTE 1 These units are equipped with connection error prevention circuits. If the units do not operate, it is possible that the connection error prevention circuits have been operated. In such cases, check that the drive wires (connected to terminals ① and ②) and the control wires (connected to terminals ③ and ④) are connected correctly. If they are connected incorrectly, connect them correctly. Normal operation should then commence.





NOTE 2 Do not short the remote control unit wires to each other. (The protection circuit will be activated and the units will not operate.) Once the cause of the short is eliminated, normal operation will then be possible.

NOTE 3 When running the units in heating mode during test operation, be sure to run the units in cooling mode first before selecting this mode. If heating mode is selected first, it may cause problems with operation of the compressor.

NOTE 4 Test operation should be carried out for a minimum of 5 minutes. (Test operation will be cancelled automatically after 30 minutes.)

NOTE 5 Test operation mode should always be cancelled once test operation itself has been completed.

NOTE 6 Emergency operation can be carried out by setting the DSW1 switch on the printed circuit board inside the outdoor unit to the EMERGENCY position. During emergency operation, any abnormalities detected by the temperature thermistors are ignored while the outdoor unit is operating, so that long-term operation in this mode should be avoided. After emergency mode operation has been completed and normal operation is to be resumed, turn the power supplies for the indoor and outdoor units off and then back on again.

- Set the abnormal temperature thermistor only to the setting in the table below when carrying out emergency operation.

	Thermistor	Cooling operation	Heating operation
Indoor unit side	Room temperature detection	Fixed at 25°C	
	Pipe temperature detection	Shorted	Open
Outdoor unit side	Discharge thermistor detection	Open	Open
	Heat exchanger outlet temperature detection	Shorted	Open

✳ Refer to the electrical circuit diagrams for details on wiring for each thermistor.

NOTE 7 If the self-diagnosis function reports a problem but more than one problem has developed at the indoor and/or outdoor units, the problem display on the remote control unit may not match the LED display on the outdoor unit printed circuit board. In such cases, check both locations and remove the causes of the problems.

10. AS TO MAKING THE INSPECTION AFTER COMPLETION OF WORK FULLY UNDERSTOOD

- At the time when the work has been completed, measure and record the characteristics of test run without fail and keep the measuring date, etc.
- Carry out the measurement regarding room temperature outside air temperature, suction and air discharge temperatures, wind velocity, wind volume, voltage current, presence of abnormal vibration, operating pressure, piping temperature, compressive pressure, airtight pressure as items to be measured.
- As to the structure and appearance, check following items.
  - ☐ Short circuit of the blowout air.
  - ☐ Smooth flow of the drain
  - ☐ Reliable thermal insulation
  - ☐ Leakage of refrigerant
  - ☐ Mistake in wiring
  - ☐ Reliable connection of the grand wire
  - ☐ Looseness in terminal screw, fastening torque
    M3… 69-98•cm{7-10kgf•cm} M4…157-196N•cm{16-20kgf•cm}
    M5…196-245N•cm{20-25kgf•cm}

11. AS TO DELIVERY TO THE CUSTOMER

- Request the customer to operate this air conditioner viewing instruction manual come with indoor unit in practice and explain how to operate.
- Deliver the instruction manual to the customer without fail.

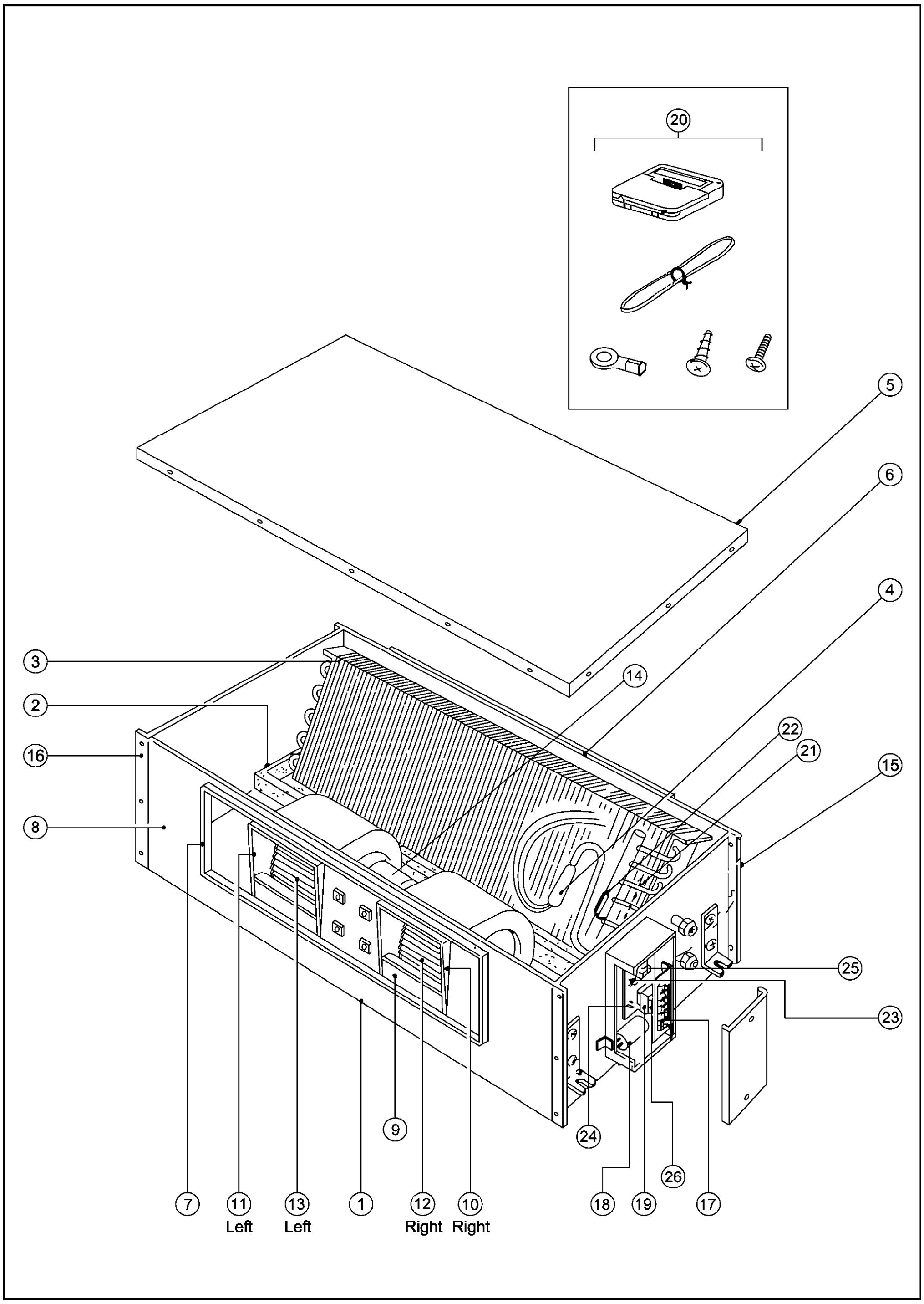
12. AS TO PARTS TO BE SOLD SEPARATELY

We are preparing air guider for outdoor unit and parts to be sold separately for indoor unit, etc., however, as to details of mounting method, etc., observe respective instruction manual.

26. REPLACEMENT PARTS

26.1. INDOOR UNIT

CS-A24BD1P, CS-A28BD1P, CS-A34BD1P, CS-A43BD1P, CS-A50BD1P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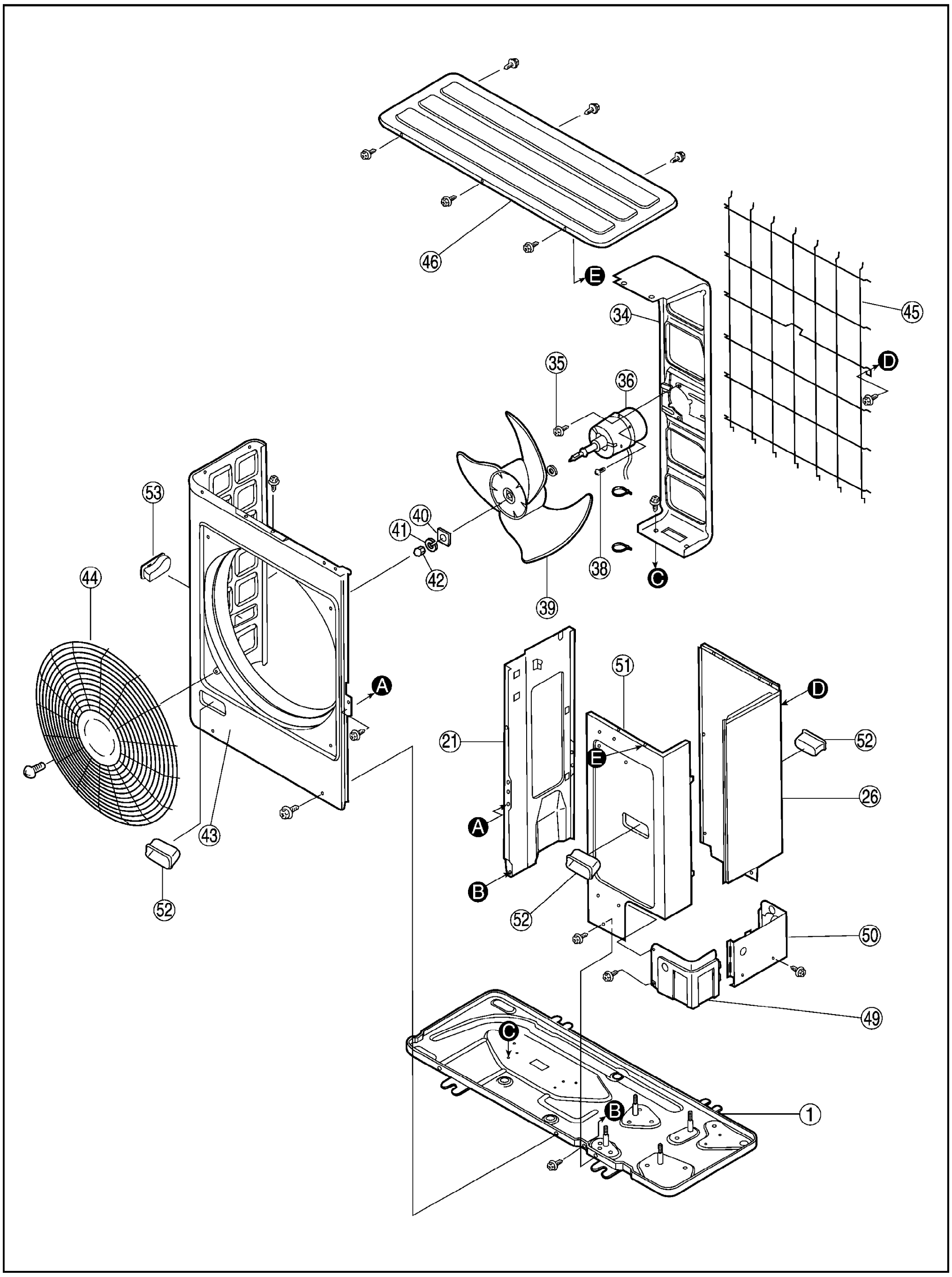
CS-A24BD1P, CS-A28BD1P, CS-A34BD1P, CS-A43BD1P, CS-A50BD1P

NO.	PART DESCRIPTION	QTY.	CS-A24BD1P	CS-A28BD1P	CS-A34BD1P	CS-A43BD1P	CS-A50BD1P
1	CABINET (BOTTOM)	1	P42-T03010	P42-T02170	P42-T01910	←	←
2	DRAIN PAN	1	P42-T02370	P42-T02700	P42-T02010	←	←
3	EVAPORATOR	1	P45-T05110	P45-T05840	P45-T05140	P45-T05150	←
4	DISTRIBUTOR ASS'Y	1	P45-T04670	P45-T04510	P45-T04940	P45-T04770	P45-T04690
5	CABINET (TOP)	1	P02-T07570	P02-T07490	←	←	←
6	CABINET (BACK)	1	P42-T03380	P42-T03400	P42-T03390	←	←
7	DUCT FLANGE ASS'Y (OUTLET)	1	P42-T02390	P42-T02150	P42-T01860	←	←
8	FAN BASE ASS'Y	1	P45-T07020	P45-T06980	P45-T07000	←	P45-T07010
9	CASING ASS'Y	1	-	-	P45-T04260	←	P45-T04050
10	CASING R ASS'Y	1	P45-T06760	←	-	-	-
11	CASING L ASS'Y	1	P45-T06770	←	-	-	-
12	IMPELLER R	1	-	-	-	-	P05-T08780
13	IMPELLER L	1	-	-	-	-	P05-T08760
14	FAN MOTOR	1	P06-T04311	P06-T04510	P06-T04321	P06-T04331	P06-T04540
15	PANEL SIDE R ASS'Y	1	P42-T03300	P42-T02980	P42-T03460	←	←
16	PANEL SIDE L ASS'Y	1	P42-T03000	P42-T02200	P42-T01890	←	←
17	TERMINAL BOARD	1	P06-T04680	←	←	←	←
18	CAPACITOR	1	P06-T04630	P06-T04640	←	P06-T04660	P06-T04670
19	TRANSFORMER	1	P06-T04300	←	←	←	←
20	REMOTE CONTROL (P)	1	A75C2240	←	←	←	←
21	THERMISTOR ASS'Y	1	06-854510	←	←	←	←
22	COIL SENSOR	1	06-853760	←	←	←	←
23	PCB ASS'Y	1	A53D0003A	←	←	←	←
24	NOISE FILTER	1	A491018 (P46-T06120)	←	←	←	←
25	PCB FUSE (250V T 3.15A)	1	-	-	-	-	-
26	FUSE (250V T5A)	1	P06-T04740	←	←	←	←

26.2. OUTDOOR UNIT

CU-A24BBP5, CU-A28BBP5, CU-A28BBP8



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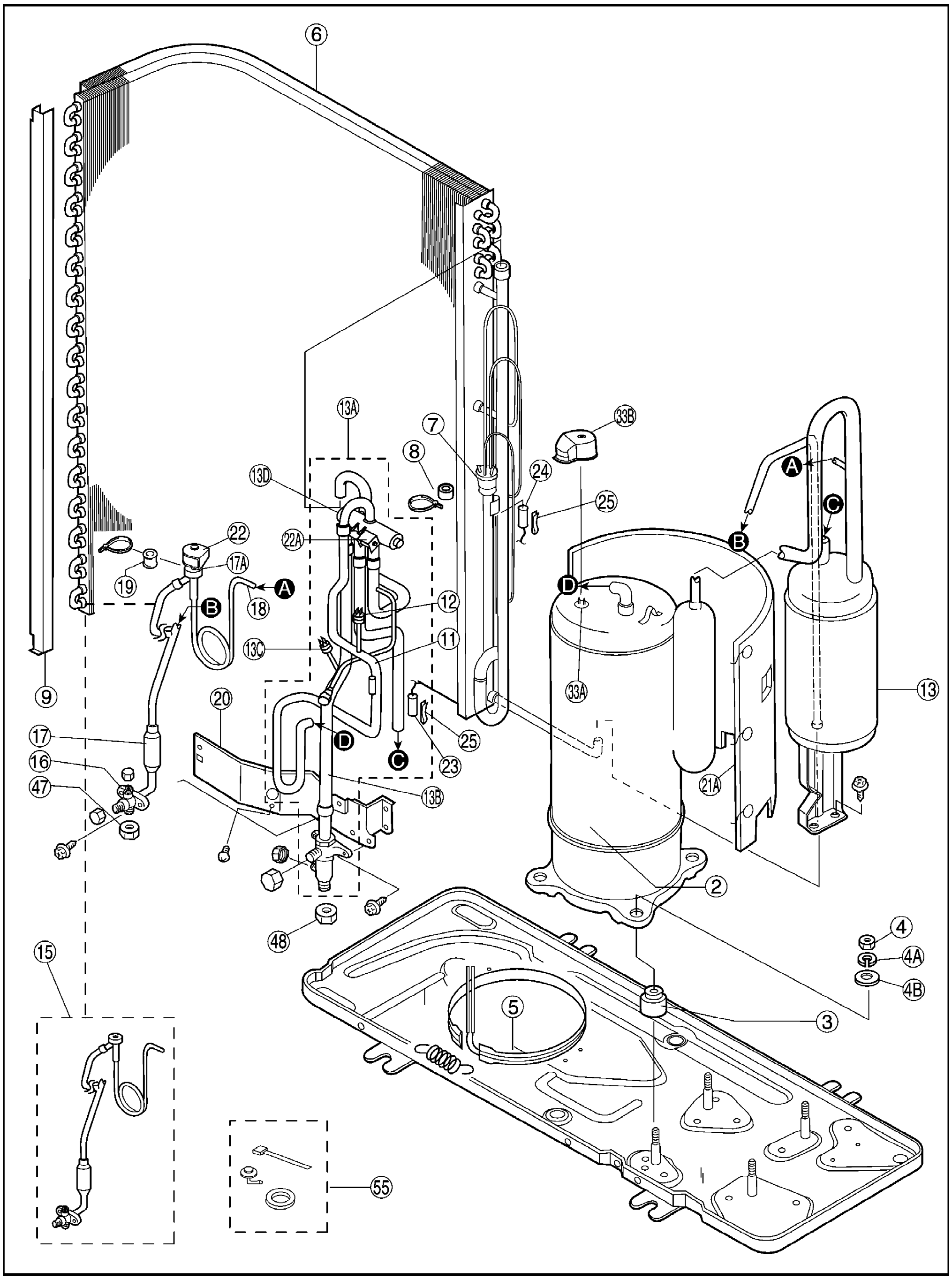
CU-A24BBP5, CU-A28BBP5, CU-A28BBP8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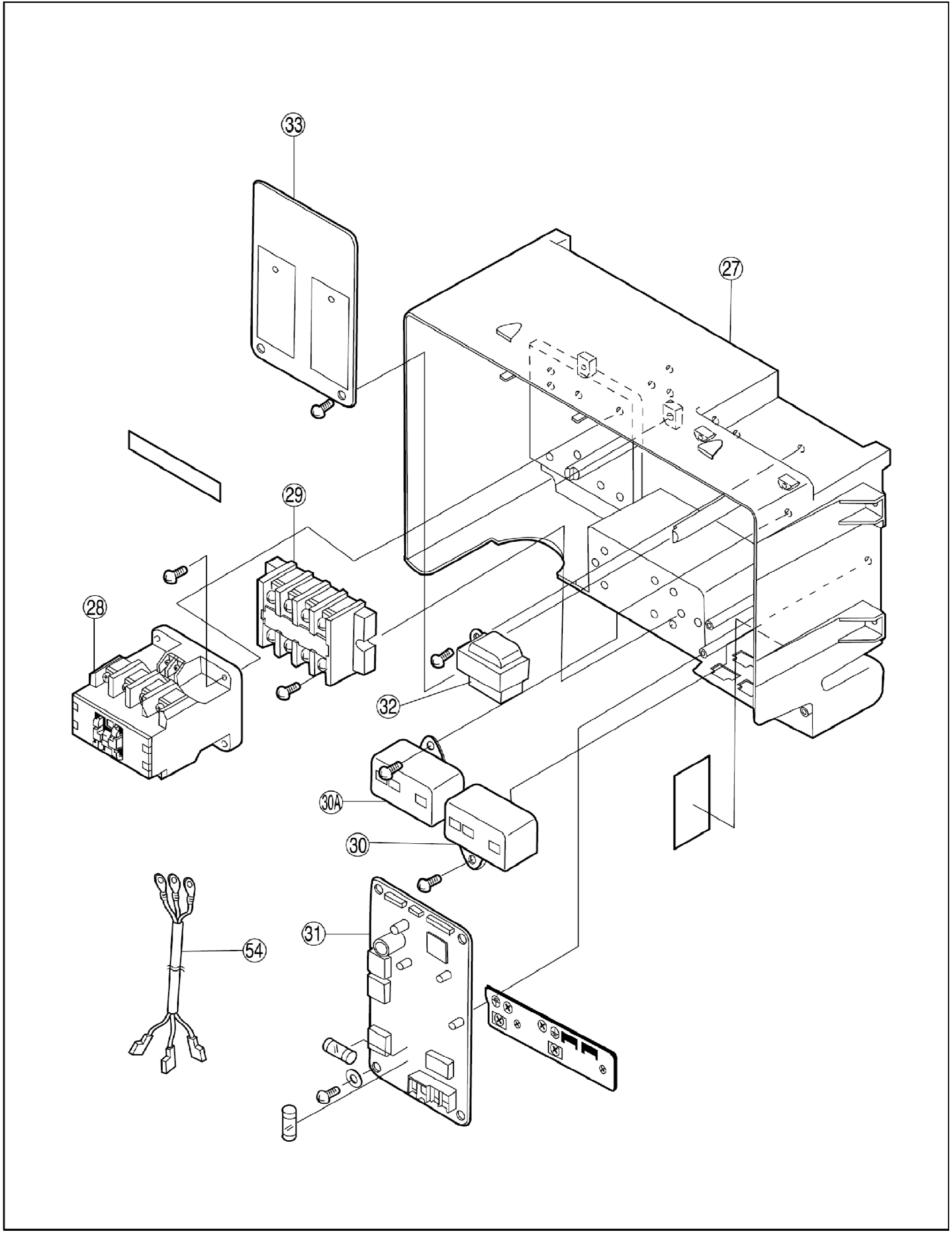
CU-A24BBP5, CU-A28BBP5, CU-A28BBP8



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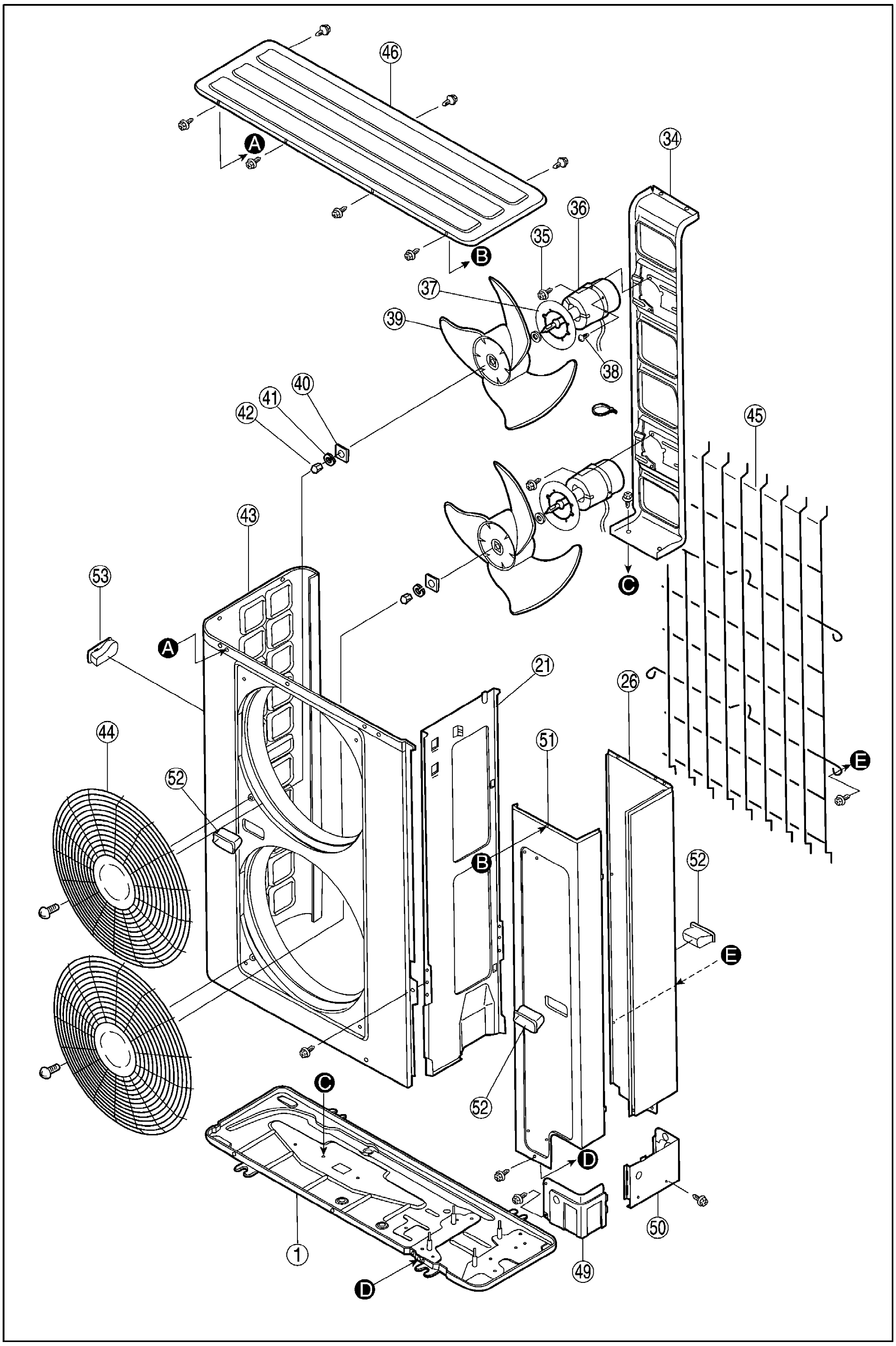
NO.	PART DESCRIPTION	QTY.	CU-A24BBP5	CU-A28BBP5	CU-A28BBP8
1	BASE PAN ASS'Y	1	CWD52K1038A	←	←
2	COMPRESSOR	1	NH41VNDT	NH44VNDT	NH44YDET
3	ANTI-VIBRATION BUSHING	4	CWH501018	←	←
4	NUT FOR COMP. MOUNT.	3	XNG8	←	←
4a	WASHER for COMPRESSOR	3	XWA8	←	←
4b	SP WASHER	3	CWH571018	←	←
5	CRANKCASE HEATER	1	CWA341005	←	←
6	CONDENSER COMPLETE	1	CWB32C1088	CWB32C1089	←
7	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT07K1045	CWT07K1046	←
8	PIPE HOLDER RUBBER	1	CWG251016	←	←
9	CONDENSER SIDE PLATE	1	CWD911122	←	←
11	TUBE ASS'Y(PRESSURE SWITCH)	1	CWT022355	←	←
12	HIGH PRESSURE SWITCH	1	CWA101002	←	←
13	ACCUMULATOR	1	CWB131007A	CWB131008A	←
13a	4-WAYS VALVE COMPLETE	1	CWB00C1002	CWB00C1003	←
13b	TUBE ASS'Y(PRESS.SW + VALVE)	1	CWT01C2285	←	←
13c	HEATING PRESSURE SWITCH	1	CWA101001	←	←
13d	4-WAYS VALVE	1	CWB00003	←	←
15	TUBE ASS'Y(VALVE+STRAINER)	1	CWT01C2282	CWT01C2283	←
16	3-WAYS VALVE	1	CWB011054	CWB011053	←
17	STRAINER	1	CWB111006	CWB111005	←
17a	2-WAYS VALVE	1	CWB02299	←	←
18	CAPILLARY TUBE for VALVE	1	CWB15K1038	CWB15K1037	←
19	PIPE HOLDER RUBBER	1	CWG251014	CWG251015	←
20	HOLDER-SERVICE VALVE	1	CWD911124	←	←
21	SOUND-PROOF BOARD ASS'Y	1	CWH151016	←	←
21a	SOUND PROOF MATERIAL-COMP	1	CWG302098	←	←
22	V-COIL COMPLETE	1	CWA43C2068	←	←

22a	V-COIL COMPLETE (4 WAY VALVE)	1	CWA43C2060	←	←
23	PIPING SENSOR (DISCHARGE)	1	CWA501042	←	←
24	PIPING SENSOR (COIL)	1	CWA501043	←	←
25	SPRING FOR SENSOR	2	CWH711010	←	←
26	CABINET REAR PLATE	1	CWE02C1005	←	←
27	CONTROL BOARD	1	CWH141004	←	←
28	COMPRESSOR RELAY	1	CWA001005	←	CWA001007
29	TERMINAL BOARD ASS’Y	1	CWA28K1027	←	CWA28K1029
30	CAPACITOR-FAN MOTOR (3 / 460)	1	DS461305QP-A	←	←
30a	CAPACITOR-COMP (MF/V)	1	DS441456CPNB / (45 / 440)	DS441506CPNB / (50 / 440)	-
31	ELECTRONIC CONTROLLER	1	CWA742583	←	CWA742584
32	TRANSFORMER	1	CWA401029	←	←
33	CURRENT TRANSFORMER BOARD	1	CWA742591	←	CWA742592
33a	OVERLOAD PROTECTOR	1	-	-	CWA121075
33b	TERMINAL COVER	1	CWH171019	←	CWH171022
34	BRACKET FAN MOTOR	1	CWD541027	←	←
35	SCREW-BRACKET FAN MOTOR	4	CWH551040	←	←
36	FAN MOTOR	1	CWA951077	←	←
38	SCREW-FAN MOTOR	4	CWH55442	←	←
39	PROPELLER FAN	1	CWH001007	←	←
40	WASHER for P.FAN	1	CWH571013	←	←
41	SPRING WASHER for P.FAN	1	XWB10B	←	←
42	NUT for PROPELLER FAN	1	CWH56033	←	←
43	P.FAN AIR GUIDER PLATE	1	CWE061036A	←	←
44	FAN GUARD	1	CWD041014A	←	←
45	CONDENSER GUARD	1	CWD041015A	←	←
46	CABINET TOP PLATE COMPLETE	1	CWE03C1004	←	←
47	FLARE NUT (1/4”) / (3/8”)	1	6002140 (1/4”)	CWT25005 (3/8”)	←
48	FLARE NUT (5/8”)	1	CWT25004	←	←

49	PIPE COVER (FRONT)	1	CWD601017A	←	←
50	PIPE COVER (BACK)	1	CWD601018A	←	←
51	CABINET FRONT PLATE	1	CWE06C1033	←	←
52	HANDLE	3	CWE161008	←	←
53	HANDLE	1	CWE161009	←	←
54	LEADWIRE-COMPRESSOR	1	CWA67C3657	←	CWA67C3665
55	ACCESSORY COMPLETE	1	CWH82C1105	←	←
	INSTALLATION INSTRUCTION	1	CWF612231	←	←

CU-A34BBP5, CU-A34BBP8, CU-A43BBP8, CU-A50BBP8



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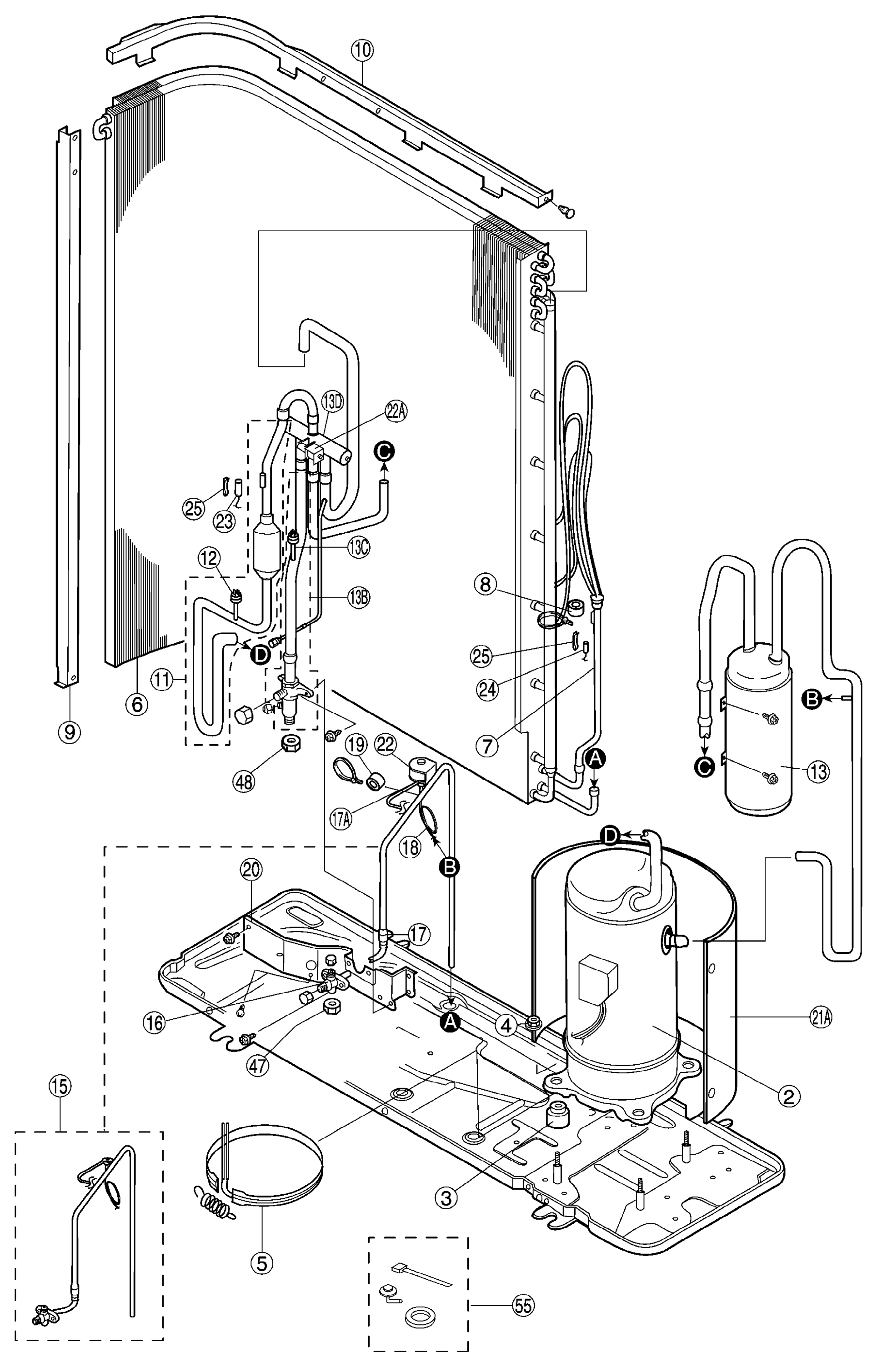
CU-A34BBP5, CU-A34BBP8, CU-A43BBP8, CU-A50BBP8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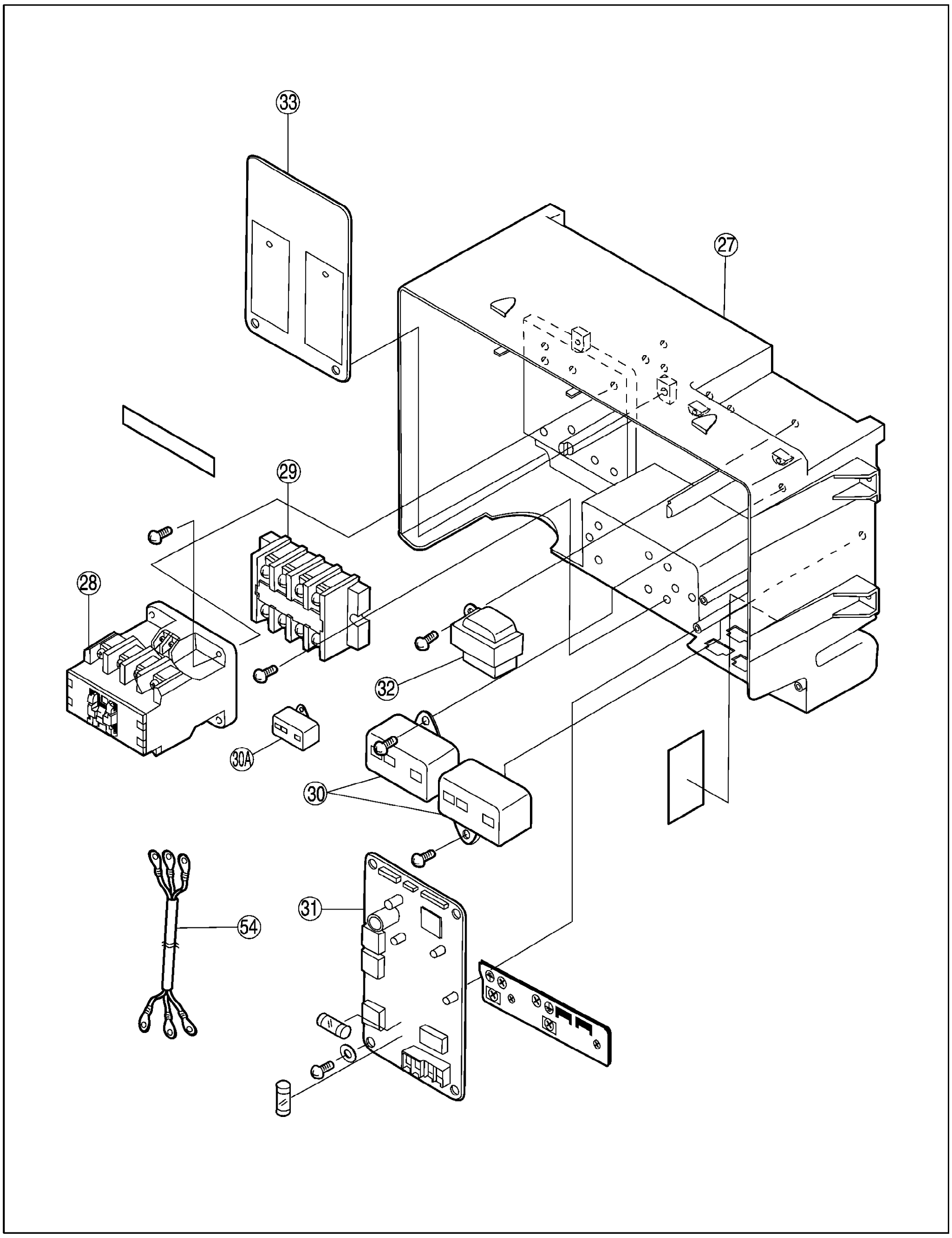
CU-A34BBP5, CU-A34BBP8, CU-A43BBP8, CU-A50BBP8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NO.	PART DESCRIPTION	QTY.	CU-A34BBP5	CU-A34BBP8	CU-A43BBP8	CU-A50BBP8
1	BASE PAN ASS'Y	1	CWD52K1039A	←	CWD52K1040A	←
2	COMPRESSOR	1	ZR47K3PFJ522	ZR45KCTFD522	ZR57KCTFD599	ZR68KCTFD599
3	ANTI-VIBRATION BUSHING	4	CWH501020	←	←	←
4	NUT FOR COMP. MOUNT.	3	4582065	←	←	←
5	CRANKCASE HEATER	1	CWA341004	←	CWA341002	←
6	CONDENSER COMPLETE	1	CWB32C1094	←	CWB32C1095	CWB32C1096
7	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT07K1023	←	CWT07K1048	CWT07K1049
8	PIPE HOLDER RUBBER	1	CWG251016	←	CWG251021	←
9	CONDENSER SIDE PLATE	1	CWD911123	←	←	←
10	CONDENSER TOP PLATE	1	CWD911132	←	CWD911133	←
11	TUBE ASS'Y(PRESSURE SWITCH)	1	CWT022371	←	CWT022374	←
12	HIGH PRESSURE SWITCH	1	CWA101002	←	←	←
13	ACCUMULATOR	1	CWB131009A	←	CWB131011A	CWB131012A
13b	TUBE ASS'Y(PRESS.SW + VALVE)	1	CWT022370	←	CWT022373	←
13c	HEATING PRESSURE SWITCH		CWA101001	←	←	←
13d	4-WAYS VALVE	1	CWB001014	←	CWB001015	←
15	TUBE ASS'Y(VALVE+STRAINER)	1	CWT022359	←	CWT022360	CWT022361
16	3-WAYS VALVE		CWB011058	←	←	←
17	STRAINER		CWB111005	←	←	←
17a	2-WAYS VALVE		CWB02299	←	←	←
18	CAPILLARY TUBE for VALVE	1	CWB15K1037	←	CWB15K1039	CWB15K1040
19	PIPE HOLDER RUBBER	1	CWG251015	←	←	←
20	HOLDER-SERVICE VALVE	1	CWD911131	←	←	←
21	SOUND-PROOF BOARD ASS'Y	1	CWH15K1001	←	←	←
21a	SOUND PROOF MATERIAL-COMP.	1	CWG302101	←	CWG302103	←
22	V-COIL COMPLETE	1	CWA43C2067	←	←	←
22a	V-COIL COMPLETE-4 WAY VALVE	1	CWA43C2063	←	←	←

23	PIPING SENSOR (DISCHARGE)	1	CWA501044	←	←	←
24	PIPING SENSOR (COIL)	1	CWA501045	←	←	←
25	SPRING FOR SENSOR	2	CWH711010	←	←	←
26	CABINET REAR PLATE	1	CWE021012A	←	CWE02C1006	←
27	CONTROL BOARD	1	CWH141004	←	←	←
28	COMPRESSOR RELAY	1	CWA001006	CWA001005	←	←
29	TERMINAL BOARD ASS'Y	1	CWA28K1027	CWA28K1029	←	←
30	CAPACITOR-FAN MOTOR (3 / 460)	2	DS461305QP-A	←	←	←
30a	CAPACITOR-COMP (MF/V)	1	DS371606CPNA (60 / 370)	-	-	-
31	ELECTRONIC CONTROLLER	1	CWA742590	CWA742585	←	←
32	TRANSFORMER	1	CWA401029	←	←	←
33	CURRENT TRANSFORMER BOARD	1	CWA742591	CWA742592	←	←
34	BRACKET-FAN MOTOR	1	CWD541028	←	←	←
35	SCREW-BRACKET FAN MOTOR	4	CWH551040	←	←	←
36	FAN MOTOR	2	CWA951077	←	←	CWA951078
37	FAN MOTOR SUPPORTER	2	-	←	←	CWD932142
38	SCREW-FAN MOTOR	8	CWH55442	←	←	←
39	PROPELLER FAN	2	CWH001007	←	←	←
40	WASHER for P.FAN	2	CWH571013	←	←	←
41	SPRING WASHER for P.FAN	2	XWB10B	←	←	←
42	NUT for PROPELLER FAN	2	CWH56033	←	←	←
43	P.FAN AIR GUIDER PLATE	1	CWE061042A	←	CWE061044A	←
44	FAN GUARD	2	CWD041014A	←	←	←
45	CONDENSER GUARD	1	CWD041016A	←	CWD041017A	←
46	CABINET TOP PLATE COMPLETE	1	CWE03C1004	←	CWE03C1005	←
47	FLARE NUT (3/8")	1	CWT25005	←	←	←
48	FLARE NUT (6/8")	1	CWT251012	←	←	←
49	PIPE COVER (FRONT)	1	CWD601017A	←	←	←
50	PIPE COVER (BACK)	1	CWD601018A	←	←	←

51	CABINET FRONT PLATE	1	CWE061046A	←	←	←
52	HANDLE	3	CWE161008	←	←	←
53	HANDLE	1	CWE161009	←	←	←
54	LEADWIRE-COMPRESSOR	1	CWA67C3876	CWA67C3656	←	←
55	ACCESSORY COMPLETE	1	CWH82C1105	←	←	←
	INSTALLATION INSTRUCTION	1	CWF612231	←	←	←

All parts are supplied from MACC, Malaysia (Vendor Code: 086)